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DEDICATED,

WITH SINCERE RESPECT,

TO

THE OFFICERS

OF

HIS MAJESTY'S NAVY,

BY

THE AUTHOR.

ADVERTISEMENT.

A WORK embracing the several subjects connected with naval duties, and nautical affairs in general, has long been sought by the Officers of His Majesty's Navy, and others interested in maritime pursuits. Indeed, nothing in the shape of a Sea-Officer's Manual has before appeared. The present publication, it is hoped, will not altogether fail in supplying the deficiency.

In the composition of these volumes, conciseness and classification have been particularly studied.

A few anomalies and discrepancies are pointed out, in the hope of preventing their being longer overlooked by authorities.

The Author takes this opportunity to return his best thanks to Sir John Franklin, for his paper on "CHRONOMETERS;" to Captain James Clark Ross, for his article on "MAGNETISM;" and to Lieut. H. Raper, for the ILLUSTRATIVE DESIGNS, from which the engravings in these volumes are taken.

VOLUNTEER.

THE Lords Commissioners of the Admiralty approve the entrance of the VOLUNTEER into His Majesty's Naval Service at the age of thirteen.*

At these years it cannot be expected that any extraordinary progress should have been made in the academical studies of the naval novice; but, when he is destined for His Majesty's service, the parents or guardians of the youth should take especial precaution that he be not deficient in arithmetic, geography, and astronomy. A proficiency in the French language is also desirable. Nor should

* The last Regulation which relates to the "entry" of Young Gentlemen will be found in an official Memorandum at the end of this Chapter.

the naval aspirant be ignorant of the rudiments o drawing. This, though seldom considered as mor than a refined accomplishment, becomes to the sea officer an acquirement of the first importance.*

FIRST EMBARKATION.†

On his first embarkation, the Volunteer will hav little else to do than to "keep his eyes an his wits about him." The First-Lieutenant o Commanding Officer will hand him over to the Ca terer of the Midshipmen's mess. A steady ma will be appointed to sling his hammock, and t

* While speaking of the great advantages arising from gener intellectual culture among young gentlemen in the service, let no the advice of a distinguished Admiral be forgotten—namely, tha to other studies should be added the acquirement of a knowledg of scriptural history, ancient history, and of the records connecte with the rise and progress of the British colonies.

The author himself found the study of "Vatel's Treatise o International Law" of great service to him in the discharge of delicate and onerous duty.

† Previously to a first fit-out, it is recommended to the paren of the young gentleman to consult the Captain or the Fir Lieutenant of the ship he is about to join, as to particulars relat to the dimensions of his chest. Before now, young gentlem have embarked in *Ten-gun brigs* with chests of such unreasona size as to preclude the possibility of their descending the hat ways of the vessel. For the sake of uniformity and stowage, it w desirable that one universal size were established in the service.

ake it up and down morning and evening. A rivate marine (provided the man's services be oluntarily obtained) may be also permitted to act n the capacity of the young gentleman's servant. Vith this indulgence* — for such it must be ever onsidered—no excuse can be offered, nor any aken, for negligence or uncleanliness in the oungster's personal appearance.

MORNING ABLUTIONS.

By seven bells — half-past seven — his morning ablutions must be completed, and care taken that no washing nor "*toilet*" utensils—towels,† basins, *boot-jacks* or *brushes*—be found astray on the decks, or "adrift" in the vicinity of the gun-room or steerage. And here the novice must clearly

* This indulgence has, of late years, become very prevalent in e Navy. Young Gentlemen are, however, apprized that the ntract between the man and master is altogether of a *private* ture, and not recognised as a duty devolving on the former. monthly remuneration—from three to five shillings—is the cus- nary sum paid for the services of the party employed.

† In some ships a line is allowed to be triced up between the ain and mizen rigging for the purpose of drying the Midshipmen's els. This practice is preferable to replacing them in a damp dition in their chests.

understand, that unless he present himself at the breakfast-table properly attired, he will forfeit his morning-meal.*

SALUTE TO THE QUARTER-DECK.

Whenever he ascends the quarter-deck, which at all times is to be considered and respected as the King's Parade, he is strictly enjoined to observe the customary salute of the service. This consists in raising the hat from the head, or, as it is technically termed, "touching it," immediately upon stepping on the deck.

SCHOOL HOURS AND STUDIES.

If the ship bear a Schoolmaster,† the hours from nine to half-past eleven in the forenoon will be

* Attention to the gentlemanly order of the Midshipmen's Mess should be the Caterer's principal aim. In line-of-battle ships, it rivals ward-room establishments in respectability and order. In smaller vessels, from local and other causes, Midshipmen's Messes are not altogether so striking in appearance. Nevertheless, the same rules are requisite.

† Upon the advantages of uniting the two situations of Chaplain and Schoolmaster, the reader is referred to an able paper which appeared in the "*United Service Journal*" of October, 1830.

exclusively devoted to the study of geometry and navigation;* but a close application to the mathematics is particularly recommended. Independently of its practical utility in demonstrating the rules common to navigation and nautical astronomy, a certain degree of mathematical learning imparts clearness and exactness to all our conceptions.

"Without presuming to dictate the studies," says an able professional writer, "which are most essential to his improvement, we would wish to recommend such as are most suitable to the bent of his inclination. Astronomy, geometry, and mechanics, which are in the first rank of science, are the materials which form the skilful navigator and superior seaman. The theory of navigation is entirely derived from the two former, and all the machinery and movements of a ship are founded upon the latter. The action of the wind upon the sails, and the resistance of the water at the stem, naturally dictate an inquiry into the property of

* A concise practical work on Navigation has been long sought in the Service. It is to be hoped the day is not distant when such a production will appear. Ridley is, at present, considered to be the most useful book for beginners.

solids and fluids; and the state of the ship, floating on the water, seems to direct his application to the study of hydrostatics and the effects of gravity. A proficiency in these branches of science will equally enlarge his views with regard to the operations of naval war, as directed by the efforts of powder and knowledge of projectiles. The most effectual method to excite his application to those studies is, perhaps, by looking round the Navy, to observe the characters of individuals. By this inquiry, he will probably discover, that the officer who is eminently skilled in the sciences will command universal respect and approbation; and that whoever is satisfied with the despicable ambition of shining the hero of an assembly will be the object of universal contempt. The attention of the former will be engaged in those studies which are highly useful to himself in particular, and to the service in general. 'The employment of the latter is to acquire those superficial accomplishments that unbend the mind from every useful science, emasculate the judgment, and render the hero infinitely more dexterous in falling into his station in the *dance* than in the line of battle."

LEARNING TO KNOT AND SPLICE.

HE Captain who studies the welfare and advancement of those committed to his charge, will point a steady petty-officer, a thorough seaman, to teach the Young Gentleman the art of knotting and splicing, and general rudiments of rigging. Professional deficiency is soon detected by the officers; nor does it pass unobserved even by the foremastmen. The seaman knows well when it is the *seaman* that commands. A seamanlike order is promptly and cheerfully obeyed. A "lubberly" mandate produces disgust, dissatisfaction, and unwillingness to work—too often an irretrievable loss of valuable time, and invariably a universal feeling of contempt (however hidden and suppressed) for the officer commanding.

ADDRESS EVERY MAN BY HIS NAME.

AND here may be offered a further friendly admonition. Upon whatever occasion, public or private, the foremastman be addressed, let him be called by his name. If unacquainted with that, let some

kind or encouraging epithet be adopted. The appellative of "*my man*" can offend no man, whilst that too frequently applied epithet "*You, sir!*"* obnoxious to the meanest boy. Not that the v gar practice of courting popularity is here advocat Affected humility may be said to be meanness p sonified; whilst low familiarities debase, and at o destroy every feeling of respect. The instant officer descends to be familiar with the men authority sinks—neither can he expect nor ex obedience.

TECHNICAL TERMS.

THE volunteer must use every endeavour to acqu a ready acquaintance with technical terms — t

* A moral may be found in the following anecdote:—When author served with the late Lord Collingwood, a Lieutenant His Majesty's Ship C—— had the presumption, in the prese of the Admiral, to apply the phrase "*You, sir!*" to one of t afterguard on the quarter-deck. The Admiral reiterated t offensive appellative "*You, sir!*" "*You, sir!*" The Lieutena at a loss for the Admiral's meaning, approached his superior, in hand. "*You, sir!*" continued the Admiral, emphatically peating the obnoxious phrase as he stared the Lieutenant full the face—"How do you, Sir, like to be *you-sir'd?* That man h a name as well as *you*, Lieutenant ———."

The author was a boy at the time, but from that period to t present he has invariably *forgotten* to "*you-sir*" a man.

names severally applied to the standing, and running rigging. Nor should apprehension of ridicule or laughter deter him from pursuing his purpose. The merry Mid will have his joke—play his pranks—persuade the uninitiated lad that "gooseberries grow in the main-top"—that "Flemish horses are found aloft," and that "dead men frequently dangle from the yards." In a word, the novice must not be unprepared to expect some practical experience in the "practical joke." But all must be taken in good part. The slightest betrayal of sullenness, petulance, or passion, will only produce an increase of banter. In short, the better the display of temper, the sooner will terminate the waggish war.

PROFESSIONAL ATTAINMENT.

NOTHING is sooner discernible, nor sooner appreciated, in the naval service, than an early desire to attain professional knowledge. This ready disposition is at once "seen, felt, and understood," by all on board—by the men, no less than by the officers. The superior then becomes the encouraging instructor; the inferior, the voluntary

tutor. "That young gentleman," a petty-officer will observe, "is determined, I see, to be a seaman. Come, sir," will he add, accosting his youthful superior in a tone of becoming respect—"Come, sir, *I'll* shew you the use of that rope, and the way that it leads aloft." Such opportunities to acquire a practical acquaintance with the standing rigging and the running ropes ought rather to be sought than shunned.*

Should the volunteer embark on board a vessel newly commissioned, he must avail himself of every advantage which first equipments invariably afford. By close observation and well-timed inquiry, considerable progress may be made in the rudiments and practice of "rigging." Intelligent and observing lads have, before now, *previously to leaving* port, been able to answer all the nice questions

* "Unless the Midshipman," observes a professional writer, "has an unconquerable aversion to the acquisition of those qualifications which are so essential to his improvement, he will rarely want an opportunity in making a progress therein. Every step he advances in those meritorious employments will facilitate his accession to the next in order. If the dunces who may be his messmates are rattling the backgammon dice, roaring bad verses, hissing on the flute, or scraping discord from the fiddle, his attention to more serviceable studies will sweeten the hours of relaxation."

touching the "clothing" of a battle ship's bowsprit; and the son of a gallant and distinguished officer in the service, not more than four months "borne on the books," became, from observation alone, perfectly acquainted with the principle and practice of shifting a topmast.*

PUTTING FIRST TO SEA.

SEA-SICKNESS. — The best specific that can be offered for this unmanning malady is to persevere in a spirited determination to conquer it. Lying in bed, or lounging below, will be of no avail. On the contrary, such practices tend only to prolong suffering, and debilitate the body. Howsoever "sick," determine to keep the deck, inhale the open and sea-bred breeze, and, though an awkward stagger be discernible in the step, persevere in the "*walk*" fore-and-aft. † Sea-legs will imperceptibly come, and sea-sickness gradually subside.

GOING ALOFT. — As soon as "sea-legs are

* This fact was, by his captain, recorded in the young gentleman's official certificate.

† Whilst, at the patient's expense, healthy and hearty mids are cracking occasional jokes, the unpitied sufferer may be cracking ginger-bread nuts, an excellent specific for sea-sickness.

found," and sea-sickness is fairly overcome, the young gentleman should habituate himself in going aloft. But, in ascending the shrouds, caution is emphatically directed against trusting too much to the ratlings of the rigging (the steps of the ladder.) The shroud, and *not* the ratling, should be grasped by the hand. Should the seizing of the ratling go, or the rope be rotten, the body may lose its balance, and, in all probability, a promising life be lost to His Majesty's service.

WALKING THE WEATHER-SIDE.

On no occasion are young gentlemen to walk the Weather-side of the quarter-deck. At sea, the Lee-side becomes the midshipmen's parade. When young gentlemen creep over to windward, to accompany their superiors in their step, (which, since the peace establishment, has become so prevalent a practice,) they infringe the rules of the service, and may be said to be "treading on tender ground."

LOG NOT IN ARREAR.

The volunteer should not allow his log to be ever in arrear, but should commit to writing (according

to the formula established the diurnal proceedings of the ship. A few minutes in the evening may be advantageously devoted to this purpose. The volunteer's log may be called for *inspection* at a very unexpected period; the Captain may require its production at a moment's notice: hence the necessity of the foregoing caution.

ILLUSTRATIVE SKETCHES.—Should a proficiency in drawing be already made, or the young gentleman be at all accustomed to sketch from nature, he is not only recommended to practise his pencil, but to let no opportunity pass, when coasting, or "running along the land," of taking various views, for the purpose of introducing illustrative sketches into his log. A well-preserved and neatly-written log, containing well-executed views, will not fail, on the day of trial, to procure for the young gentleman an official tribute of praise and recommendation.

WATCH, STATION, & QUARTER BILLS.

OF each of these indispensable "bills" the young gentleman will procure an early copy. The prevalent practice of borrowing the book of another,

with a view to deceive the superior, or to avoid being detected in dereliction of duty, will ensure to the borrower *nominal* notice in the "*bad*-books" of the First-Lieutenant. Refusal of "leave" becomes, in port, an unpleasant penalty. This hint, it is hoped, will suffice.

DEMEANOUR AT CAPTAIN'S TABLE.

In dining with the Captain, or with the ward-room officers, it were well to bear in mind the admirable precept of the celebrated Paley—"Dependance and obedience belong to youth: modesty is one of its chief ornaments, and has ever been esteemed a presage to rising merit." Not that an assumption of boyish bashfulness can be ever advocated; nor is a fawning, vulgar servility of tone more to be avoided than a forward familiarity of mien. In a word, a natural amenity of manner, added to a uniform observance of deferential respect for superiors in *age*, as well as in station, will always indicate the well-bred youth, and, at least, prove that there is no misnomer in the *old* official designation of the YOUNG GENTLEMAN.

ADMONITORY HINT.—Should the Captain propose to his youthful guest an *inquisitive* trip upon deck, to ascertain the quantity of sail set, the direction of the wind, or the position of the "ship's head," the young gentleman will do well to take the *hint*—return a report, and *retire* in time.

KEEPING WATCH.

UPON the size and rate of the ship will depend the necessity of compelling the volunteer to "Keep his Watch." In small vessels the complement is very limited; consequently, as there are "no more cats than can catch mice," the services of young gentlemen are often put into early requisition.

An intelligent officer and deservedly-popular author* has said, that "to a lad who has health and spirits, keeping watch is rather agreeable than otherwise." In saying this, he "speaks from twelve years of almost uninterrupted practice," and declares, upon the whole, that "its pleasures outweigh its annoyances. There is no opiate," continues the Captain, "that ever was devised, which gives

* Captain Basil Hall.

such hearty relish to sleep as a good four-hours' night-watch. Without refining or philosophizing too deeply, every one, I am sure, who has tried the experiment, will recollect the sort of complete self-satisfaction with which he has 'turned in,' after having gone through his work, and stripped off his dripping clothes; still less will he forget the delighted kind of hug which he has bestowed upon himself when fairly under the blankets. All the world is then forgotten; the gale may be rising, the ship in no great safety, the labours of the night just beginning—no matter, his watch is out — his task is done. 'I'll go to sleep,' he says; and, sure enough, a young middy, after the *weary* watch is out, lies down as perfect a personification of Shakspeare's ship-boy as imagination could desire."

This is all very well in its way—prettily expressed, and admirable reading. But it may be safely asserted, that *nine* out of ten youngsters will prefer the precept to the practice. Moreover, in this mode of ensuring sleep, it may be well to observe, that it is the *Captain*, and not the "Middy," that now *composes*. It is not disputed that "keeping watch" ensures the certainty of sleep—stern Nature

constantly proves the reverse, despite, too, of discipline the most rigid and severe.* To her overpowering spell the youngster yields, and, by stealth or stratagem, "sleeps on his watch," stretched on the wet or water-sodden plank. Hence it is, possessed of this fact, that the fullest possible dispensation of drowsy service is advocated. How frequently the kind-hearted Lieutenant is heard to exclaim, "Go to bed, youngster,—you only knock your shins against the carronade slides."

In the practical tuition of keeping watch, the boy may be gradually "broken in." One night he may keep the first two hours of the "First-Watch;" another, part of the "Middle," and, during the season of Summer, the "Morning Watch" entire—the last will conduce to his health. In the above arrangement, a conditional compact may be made between the youngster and the officer of his watch—the former to understand that upon

* In the juvenile days of the author, when young gentlemen were surprised or detected in deck-somnolency, a couple of tall topmen were directed to introduce them to the weather-main-rigging. For one hour, four ratlings high, and face to windward, were they compelled to remain in this *pleasant* position. This penal practice has become obsolete, and now unknown in His Majesty's Service.

every occasion of a "*bad relief*" the indulgence becomes null and void.

By such like considerate system, both the task, and the trial of "keeping watch and *awake*," will alike become progressively lighter, a willing ear will be lent to the quarter-master's call, and, though last, not least in professional value, the praiseworthy practice of a "*quick turn-out*"* will habitually follow.

PECUNIARY MATTERS.

As order and regularity are of the greatest necessity in money transactions, and as young gentlemen are too apt to be careless in this matter, their attention is directed to the following method, by which much perplexity may be avoided.

Instead of resorting to the Captain† for supplies of money without the precaution of inquiring previously whether he is at leisure or not, the young gentleman is recommended to send the steward to the cabin to ascertain whether it is convenient to

* The "Quick Relief" has been frequently rewarded by an early return to bed.

† In some ships the Purser undertakes the management of the young gentlemen's pecuniary matters.

the Captain to see Mr. ———. In the event of an affirmative answer, the young gentleman may present himself, and make his request; but he should always have with him his account book, in which the sum supplied should be immediately entered. This book and the Captain's, will, with such care, be a check each on the other, a great advantage to both.

EPISTOLARY CORRESPONDENCE.

It is much to be regretted that young gentlemen [redacted] not oftener take advantage of the enviable [redacted]portunities, afforded by visits to various parts [redacted]the globe, of writing letters to their friends. [redacted]uch of the rare intellectual power possessed by [redacted]rd Collingwood was, in all probability, derived [redacted]m his early custom of communicating to his re-[redacted]ions at home whatever he had observed in the [redacted]urse of his many voyages. The young gentle-[redacted]n is therefore recommended to practise letter-[redacted]iting, which will not only sharpen his powers of [redacted]ervation, and induce him to be always on the [redacted]tch for subject-matter, (thereby storing his mind [redacted]th useful facts,) but will be an admirable discipline

for his mental faculties, inasmuch as the habits of literary composition, necessary even in the most familiar correspondence, will impart order and strength to his ideas, and give him facility of expression both in writing and speaking; an accomplishment highly necessary in his future elevation to rank. What delight, too, will the receipt of such letters give to the parents of the writer, who, in the anxiety of their hearts, may attribute long silence to some disastrous occurrence, or will be sorely mortified if it be broken only through the medium of a *stamp*, beginning with the words "Three months after date a mode of correspondence too exclusively adopt by the thoughtless, the unfeeling, the selfish, a the idle.

INDULGING IN THE MARVELLOUS.

In concluding the Chapter of the Volunteer, legacy is left in the shape of an admonitor moral. The bequest is valuable: it comes from t well-known Moral Philosopher Paley.

"Many people indulge, in serious discourse, habit of fiction and exaggeration in the accoun they give of themselves, of their acquaintance, or

the extraordinary things which they have seen or heard; and so long as the facts they relate are indifferent, and their narratives, though false, are inoffensive, it may seem a superstitious regard to truth to censure them merely for truth's sake.

"In the first place, it is almost impossible to pronounce before hand, with certainty, concerning any lie. *Volat irrevocabile*, and collects sometimes accretions in its flight, which entirely changes its nature.

"In the next place, this liberty in conversation defeats its own end. Much of the pleasure, and all the benefit of conversation, depends upon our opinion of the speaker's veracity, for which this rule leaves no foundation. The faith indeed of a hearer must be extremely perplexed who considers the speaker, or believes that the speaker considers himself, as under no obligation to adhere to truth, but according to the particular importance of what he relates.

"But besides and above both these reasons, *white* lies always introduce others of a *darker* complexion. I have seldom known any one who deserted truth in trifles that could be *trusted* in matters of importance."

THE last Regulation which relates to the "entry" of Young Gentlemen will be found in the following official

MEMORANDUM.

Admiralty, 11th Oct. 1834.

It is the direction of my Lords Commissioners of the Admiralty that in each of his Majesty's ships, commissioned after the date hereof, bearing in their complements one or more Volunteers of the First Class, only *one fresh entry into the Service* shall be made; but the remainder shall be selected, where there are more than one, by the respective Captains or Commanding Officers, from Young Gentlemen who have already been in the Service, and submitted for the approbation of their Lordships.

Ships now in commission are not to be allowed any fresh entry of Volunteers into the Service.

By command of their Lordships,

JOHN BARROW.

To all Flag Officers, Commanders-in-Chief,
Captains, and Commanding Officers of
His Majesty's Ships and Vessels.

MIDSHIPMAN.*

PRELIMINARY REMARKS.

[redacted]HE primary injunction imposed upon the Midipman will be, in the moral acceptation of the term, the study of his *station*,—to learn, to feel, to encourage and uphold the sentiment, that, though subordinate his office, it is the office of a Gentleman —a gentleman entitled to trust, and not infrequently fulfilling a post of importance.

"Obedience being the "soul of the service," it should be with the Midshipman a fixed maxim, that "He who knows not how to *obey*, will never know how to *command*." Guided by this simple aphorism,

* The Midshipman is requested to peruse the preceding Chapter.

he can err little in his professional progress: it will shape for him, as it were, his cardinal course, point his polar star, and ultimately indicate the "*True North*" of the Naval Needle.

GENERAL DIRECTIONS.

THE necessity of uniform attention in the due discharge of general duty must be manifest to every capacity. But, as buoys and beacons are placed where only sunken and hidden dangers lie, so here may be given a few "directions" and "leading marks" to avoid the shoals and shallows of the quarter-deck.

DEMEANOUR ON THE QUARTER-DECK.

THE Midshipman is never to walk with his hands in his pockets; neither is he to permit himself "to skylark," as it is vulgarly termed, or to hold jocular discourse on the quarter-deck. Young gentlemen addicted to lounging on the hammocks, or disturb-

ing, their stowage in the nettings, should be made aware that these practices are misdemeanours seldom overlooked by the First-Lieutenant.

EXECUTION OF ORDERS.

THE midshipman is to give to all around a quick eye and an open ear, and never to cause the officer in command to repeat his orders.

When an order is given, the midshipman is neither to stand still, nor to pace leisurely along the deck for the mere purpose of repeating mandatory sounds;* nor is the part of "walking speaking-trumpet", ever enacted by the midshipman of emulous mind. The moment an order has escaped the lips of his superior, he who seeks or expects official favour will *run*, and not *walk*, to carry into execution the service required.

EVOLUTIONARY DUTIES.

IN the performance of evolutionary duties, the midshipman ought not, on the completion of mi-

* In well-regulated ships this practice is considered inconsistent with discipline. One voice and one pipe are better than fifty repetitions of senseless sounds.—Silence is the soul of subordination.

nor service, to permit the men to remain inactive. He should encourage alacrity, divide them on the different ropes, and, with a silent and systematic tact, despatch them to that part or position of the deck where physical strength is most required.

STOWING HAMMOCKS.

NOTHING is more indicative of "order," or adds more to the smart and favourable appearance of a vessel-of-war, than a neat and symmetrical stowage of hammocks.

In the superintendence of this necessary duty, midshipmen are often at fault, forgetting that negligence in the performance of this service is seldom permitted to pass unnoticed.

In the stowage of hammocks, the midshipman should stand on the *opposite* side of the deck, a position which will enable him to preserve a symmetrical line, and guide and direct the "stower" in his progress fore-and-aft the netting. Midshipmen are also enjoined to be careful that the hammocks of the men be properly lashed-up. Defaulters

in this particular should be reported to the First-Lieutenant.*

DISPUTATIONS ON DUTY.

He must never permit himself to dispute with his superior on "points of service;" nor should he reply to reproof. Upon occasions of receiving censure, silence will befriend him most.

REMARKS ON SUPERIORS IN OFFICE.

It is not so much a matter of facility as the midshipman or mate may imagine, to regulate, direct, or preserve the internal economy of a vessel-of-war, and therefore it is that gentlemen are required to refrain from making remarks touching the conduct or orders of superiors in office. Instead of becoming the self-constituted censor, or enacting the part of the sea-Zoilus, the midshipman will best consult his own interest when he confines to silent thought his strictures on others. "If he be nothing unless

* In piping down hammocks, gentlemen are cautioned not to permit the men to throw them on the decks.

critical," let him criticise his own pretensions. Possibly he may then discover that unbecoming censure and unwarrantable self-sufficiency invariably go hand-in-hand.

HASTY COMPLAINTS.

HASTY complaints are to be avoided; they are seldom supportable. Before making his last official appeal, the midshipman is recommended to examine well his own conduct, and consult an elder and more experienced messmate, ere he proceeds to the quarter-deck.

OATHS AND IMPRECATIONS.

THE vulgar practice of swearing, of uttering profane imprecations and opprobrious epithets in the exercise of official duties, warrants a suspicion that he who indulges in them feels it necessary to cloak by bravado his own insufficiency. "Shew me a confirmed and habitual swearer," said a celebrated Admiral, "and I'll shew you a bad officer."

Seamen soon become callous to repeated imprecations: these, indeed, strike the ear, but produce no effect on the mind. Were it only in considera-

tion of the mere idleness of the habit, (to say nothing of the wretchedness of the taste,) it would be well to discontinue the practice. How frequently have such words been said *aside*, "Never mind *him*,—he's all froth and fire,—it's not in his *natur* to speak to a man like a man."

ABSENCE WITHOUT LEAVE.

In this misdemeanour, midshipmen are not recommended to indulge. It has ever been deprecated as a vile and "privateer practice," from which may be traced the far-fetched phrase, "taking French leave." Practitioners, however, of the present "free-and-easy" school, preferring the English to the French allusion, designate the "liberty," "ashore on the *new* Act." But the act is an old one, and has seldom passed with impunity.*

* A midshipman of a frigate in which the author had served was in the constant habit of indulging in this Gallic liberty. The First-Lieutenant, aware of his freaks, for four or five successive nights, permitted him unmolested to follow his "fling." The nocturnal roamer would return on board about six in the morning, entering one of the bridle ports on the main-deck. The First-Lieutenant was something of a wag, and had planned for the fearless offender a punishment which the latter was little prepared to expect. At an early hour in the morning, the midshipmen were summoned on deck—Watch, or no watch, all were required to appear on the

EXERCISING THE LEAD.

THE midshipman should occasionally practise the art of heaving the lead, and make himself thoroughly acquainted with the several "marks and deeps," and the mariner's method of holding and coiling the line. Deficient in these practical matters, a midshipman, after some three years' service at sea,

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King's Parade. The master-at-arms, the corporal of marines, together with nine rank and file, regularly accoutred with cross belts, and armed with drawn bayonets, had been previously planted in line in the immediate vicinity of the cook's coppers. As usual, boarding on the bow, and entering the "bridle," attired in top-boots and his shore-going suit, the new actor was not a little surprised to find, drawn up in full array, a guard of honour ready to receive him in the galley.

In accordance with his private instructions, the master-at-arms proceeded to tap the defaulter on the shoulder, intimating to him that he was already his prisoner, and requiring him forthwith to "fall in" in the line for military escort. "Right-about face! march!" cried the commander of the "party," parading his prisoner twice around the main-deck, gangways, forecastle, and quarter-deck, in the presence of a numerous assemblage of boys, blue-jackets, marines, mates, and midshipmen, bursting their sides with suppressed laughter at this ludicrous scene. As soon as his second turn had been completed around the different decks, he was halted in front of the First-Lieutenant, who, with the greatest gravity, directed the cast-down criminal to "proceed forthwith to the fore-top-mast head, and to keep a good look-out that no boats *boarded on the bow.*" It is needless to add, that, though an *old* practice, the "*new act*" was never repeated.

ould present an awkward appearance were he irected to stand over the leadsman in the channels, see that his "song and his soundings" agree.

EXERCISE IN STEERING.

THE midshipman should avail himself of every opportunity to study the *secret* of steering. When unoccupied in his watch below, or when the young gentleman is at a loss to amuse his mind, let him repair upon deck, take the helm for an hour, or try a "trick at the weather wheel," to while away time. The stronger the breeze, whether steering by compass or conning by the wind, the sooner will he become practically acquainted with the power and properties of the helm. Should the ship be too much by the *head*, the helmsman is warned to expect a "taut weather helm." If, on the contrary, she swims too much by the stern, she will carry it a lee, or what is technically termed a slack helm.

WHEN STEERING BY THE WIND,—a tremulous motion in the clothes of the main-topsail (or, the main-sail, should the break of the poop obstruct the

view of the former) will always indicate that the ship is then at the desired point of "*full-and-by.*"

WHEN STEERING A COURSE, much of precision will depend upon the helmsman anticipating, or checking the ship in her inclination to yaw to starboard, or to port; nor must he trust too much to the compass-card. — The compass suffers much agitation from the motion of the vessel, and does not return sufficiently quick to its parallelism to point out the *true* position of the ship's head; whilst, on the other hand, the compass, in smooth water, requires to be touched to set it in motion. The principal requisites essential in steering are these: — a small helm, a quick eye, and ready hand to anticipate and "meet" the movement of the ship's head, and, above all, a nice acquaintance with the feel and force of the helm.†

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* When sailing obliquely to the breeze, the dog-vane does not shew the true direction of the wind.

† "The feel of the helm," says Gower, an experienced seaman, "is a nice criterion to judge whether the vessel be coming-to or falling-off. As the vessel comes to against the helm, it will feel heavier, and the wind coming forward will appear stronger; on the contrary, as she goes off, and gives way to the power of the helm, it eases in the hand, and, by the wind's drawing aft, it appears to lessen."

EXERCISE AT THE GREAT GUNS.

In a chapter dedicated to a superior officer,* the necessity of training young gentlemen at the guns is strongly urged. Every officer should make himself acquainted with the practical methods of mounting and dismounting artillery,—housing and securing guns for sea service,—training, pointing, elevating, and depressing every species of ordnance used afloat. He should also be conversant with the laws and actions of projectiles propelled by powder—the powerful effects of gravity, and resistance of the air on shot, and all the necessary knowledge requisite to constitute the naval artillerist. Indeed, it is generally believed the day is not distant when *Naval Gunnery* will form part and parcel of the Midshipman's *examination* for Lieutenant. This *hint* may serve to put young gentlemen "on their metal."

EXERCISE IN EVOLUTIONS ALOFT.

Young gentlemen sometimes mistake, or pretend to mistake, the intention of this exercise. However essential to the attainment of nautical knowledge,

* Vide First-Lieutenant.

personal "practice" in evolutionary duties aloft often, by the idle and ignorant, regarded in a pe light; whereas, if truth be told, the only individu upon whom the "pains and penalties" of *drill* a inflicted, is the officer who performs the *pleasural* part of professional tutor.—Suggestions on th subject are reserved for the consideration of th Senior Lieutenant.

CELESTIAL OBSERVATIONS.

No acquirement is of greater importance to the professional student, nor capable of affording him more of mental amusement, than the practice of taking "angular distances" between celestial bodies. By a competent knowledge of this branch of nautical science, the sea-officer arrives at results which enable him to ascertain his situation at sea when the "dead reckoning" can be no longer depended on. This is of vital necessity, as is well known in the East-India service, wherein the study in question is sedulously pursued, and the utmost advantage reaped; but, strange to say, in His Majesty's Navy little attention is paid to it. Young officers should, however, be anxious to remove this well-merited

proach. They are therefore enjoined to avail themselves of every opportunity, when "the sun and moon are in distance," to take lunar observations,* and work the results. They are also recommended to habituate themselves to the method of obtaining the latitude by the "meridional altitude" of stars.

TO KEEP A MEMORANDUM BOOK.

YOUNG gentlemen are recommended to keep a memorandum book, and to note, from time to time, any striking circumstance or "practical hint" connected with professional pursuits.

Should any vessel in port, or at the same anchorage, be seen "preparing to shift" a lower-mast or bowsprit by her own means, midshipmen will do well to solicit permission of the Senior Lieutenant to witness the process of raising sheers,† and of applying the necessary purchase to lift the spar in or out of the step.

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* It may be well to caution the observer, when taking his distances, to *note* whether his motion on the tangent screw is *progressive* or *retrograde*. The most perfect instruments have a material difference. It is not a bad rule — "Never make an observation on the *retrograde* motion." — *Belcher on Nautical Surveying.*

† Vide "Raising Sheers."

IN PORT.

KEEPING WATCH.

It may not be amiss to impress upon the midshipman's mind the contrasted results brought about by the judicious or injudicious execution of this duty. By cheerfulness, assiduity, alacrity, and care, the long-sought path to promotion has been frequently found; whilst sullenness, supineness, neglect, and mistrust, lead rarely to any other road but that of degradation or ruin.

Whether the ship be fitting or fitted, moored in port, prepared for sea, or under sailing orders, considerable charge devolves upon the midshipmen composing the watch.

The quarter-deck is never to be left without a

idshipman, nor are gentlemen to resign their harge till each individual "*relief*" is in full possession of his trust. By this precaution the precise eriod of *mishap* can never be disputed.

AVOID UNNECESSARY NOISE.

In the execution of the various duties incidental to the quarter-deck, such as conveying orders, calling side-boys, manning boats, &c., unnecessary noise should be ever avoided. Hoarse bawlings, and shrill screams, more frequently tend to impede than to promote despatch, and certainly indicate any thing rather than a ship in an orderly state. "Pipe the cutters away! Boatswain's mate!—*You*, boatswain's mate! *Where's* the boatswain's mate? Pass the word there below for the boatswain's mate." *

Such loud bellowings, and privateer shouts, may manifest pulmonary power; but he who aspires to the appellation of an officer, or desires to procure a

* It is a singular fact, that ships of the line, where so much of facility is afforded to instil and pursue a system of silence, are invariably the most noisy in the execution of those duties alluded to in the text.

ready and prompt obedience, will save his lungs and certainly pursue a more dignified and silen[redacted] system.

In well-regulated ships, "side-boys" are read[redacted] at hand, and the day, or deck, boatswain's mate i[redacted] kept within the beck of the mate or midshipman of the watch.

INDISCRIMINATE CALLS.

THE thoughtless and indiscriminate practice of calling many hands to perform duties of a trivial nature, has become too prevalent in the service to pass unnoticed. If only to sweep down a deck, or coil-up a solitary rope, the immediate cry is "After-guard and main-topmen, aft!" What is then the result?—twenty or thirty men, perhaps more, ascend the ladders, to be sent *down* again; and to be told that *two*, forsooth, are only required. Such inconsiderate calls only tend to produce dilatory movement, and unwillingness to work. "Men," says an officer of rank,* "are so frequently called when not required, that when they really are, they

* Captain J. A. Griffiths, R.N.

oubt, do not come, and incur displeasure. Precisely the boy and the wolf in the fable."

HINT.—To prevent noise, and produce something of system, two men from each department in the watch may daily, in turn, be made to perform the lighter duties of sweeping the decks, and the occasional coiling of the running ropes.

COPYING ORDERS.

WHENEVER the signal is made for a midshipman, he gentleman who proceeds to "answer it" should ppear neatly attired in his proper uniform, sideerms, &c. He should carry with him the ship's order-book," a good pen in his pocket, and use every exertion to return to his ship with due despatch.

Should the orders to be copied be likely to occupy considerable time, and be not altogether a matter of moment, the midshipman, previously to shoving off from the ship, should always ascertain from the commanding officer, whether the boat is to await his attendance. The boat's services may be required for duties of a more urgent and pressing nature.

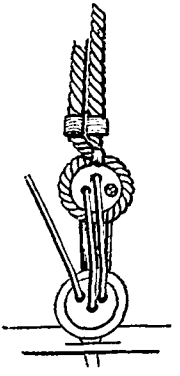
REEVING LANIARDS AND SETTING UP THE RIGGING.

FEW people are prepared to assign the reason why in reeving the laniard of the shroud, the mariner adopts one universal* mode. The best seamen, if asked, are sometimes puzzled to reply. Some will attribute the cause to the lay of the rope; speak of the hawser-laid rope, and the cable-laid rope, and the *side* of the ship to which the shroud pertains. But, as Captain Griffiths shrewdly observes, what will such seamen "do, if they be ordered to reeve the laniard in the rigging-loft, and that the knots, or mark at the eye of the shroud, be off, so that they cannot tell which *side* it is for?" The fact is, the reason is referrible to the necessity of bringing the *strain*, in setting-up, on the *standing*-part of the shroud. The *knot* of the laniard should be *rove* in the hole of the dead-eye under the *end* of the shroud. If rove the other way, through the

* With the exception of the Dutch. Dutch seamen sometimes use dead-eyes with *four* holes; reeve the laniard with *two* standing-parts, and set it up on the bight.

ble in the dead-eye *under* the *standing* part of the rroud, the strain in setting-up will fall upon the *izing*, and the dead-eye will remain on the wrong iew.

The subjoined sketch shews the manner of *reeving he laniard.*



FURLING SAILS.

SHOULD he be stationed aloft, whether between the collar of a stay, or on the top of a cap, he will, whenever the hands are turned up to furl sails, exert every endeavour to be, if possible, the first individual to reach his post. He is not to stand stationary on the top, nor to remain perched like

a parrot on the cap, reiterating senseless sound
Too much of unnecessary noise is heard aloft
without the midshipman swelling the clamour
To prevent, or prohibit noise, an officer must b
in himself an example of *silence*. The top-mid-
shipman is therefore required to preserve order,
to prevent chattering when ascending the rigging,
or lying out on the yards; to see that the earing-
men haul close out, properly pass, and secure
their respective earings;* that the reef-band of

* The method of passing reef-earings is not to be picked up upon paper; nor is it so easy to define the meaning of "*over and under*," and "*inner and outer*" turns.

The reef-earings of the topsails are passed as follows:—

For the first, second, and third reefs, take the earing up from the sail, and pass it on the fore-side of the yard, round the cleat for the purpose, through the cringle, until two, three, or four outer turns (according to the reef) be passed; then reeve the bight through the cringle from *aft* forward, taking a round turn in the cringle, and passing the end from the cringle, *under* the yard, up aloft over and through the bight, then back over the yard on the fore-side, through the cringle from underneath the yard; slew the cringle well up; pass sufficient turns to secure; expend the end round the yard, ultimately taking a half-hitch round the topsail-lift close down.

The fourth, or close reef, is passed in a similar manner, with the exception of taking the *first* turns on the *after*, instead of fore-side of the yard, in order to cover the other reefs, and to keep the cringle close up to the yard. The *outer* turns to be passed for each reef are as follows—*two* for the first reef, *three* for the second and third, and *four* for the fourth. The use of the outer turns is

ach succeeding reef be kept square along, and rought well on the top of the yard, before a single oint be tied; that then the after-legs be hauled ell taut; that when the leech be handing-in,* nd the canvass be gathering into fold and form for tossing-up, the midshipman descend from the cap to the fore part of the top, to superintend the skinning of the sail, and passing of the gaskets; and that immediately the booms be lowered, one watch be sent down on deck to assist in squaring the yards.

HINT.—In ships that preserve silence, the *mute* mode of letting go ropes is found to be most productive of despatch. Two or three *tell-tale shakes* of a rope from aloft will succeed sooner in having it disengaged on deck, than fifty hoarse and indistinct hails. Moreover, the officer stationed on the

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merely to keep the head of the sail on the stretch; whereas the *inner* turns have the whole strain of the leech to bear when the sail is hoisted and the bowline hauled.

* The ends of the untied points are to be passed in towards the bunt. Hands in the top to attend the bunt-jigger. In most ships now, the preferable practice is adopted of hooking the bunt-jigger to a becket worked in the sail, instead of securing it to two points tied together. The beckets are generally placed between the first, second, and third reefs; the first for furling with one reef, the second for furling with two.

gangway, or bowsprit, can always see the precis[illegible] period to "overhaul the reef-tackles," and let g[illegible] the buntlines.

SQUARING YARDS.

In the execution of this service, where so much depends upon the ear and the eye, midshipmen manifest little of quickness, and less of method, in the process that should be pursued. In the first instance, the lower-yard must be trussed close to the mast, then squared by the braces, and subsequently by the lifts. Pending the operation of topping on the lifts, care must be taken that hands attend the braces of the lighter and loftier yards.

Previously to squaring the topsail-yards, they are to be hoisted six or eight inches off the cap.

LOOSING SAILS.

In loosing sails, an early ascent of the midshipman becomes indispensable, for to him will the commanding-officer look, that the boom and stay-sail tracing-line-men, bowline-benders, bunt, and

yard-arm loosers be all in their respective stations; nor must boom be raised, or movement made, till the word — "*Trice*-up! — *lie-out!*" be given. The loosers should be then nimble in casting-off their gaskets; but care must be taken that the sail be properly supported in their arms until the order "Let fall!" be heard. The points and earings of the several reefs, the topmen will rapidly disengage from the yard, and the earing-men will overhaul the reef-tackles before they lie in and return to the top. The midshipman in the fore-top must be on the alert to trace-up the stay-sails between the masts.

CROSSING TOP-GALLANT YARDS.

THE midshipman stationed in the tops should be particularly careful that there be no "*singing-out*" aloft, and that those unnecessary words "*sway away*" and "*high enough*" be never allowed to escape the lips of the topmen.* The officers stationed at the yard-

* The *noise* now-a-days heard aloft in some of our ships, particularly those of the *line*, even surpasses the senseless shouts in which Spanish, Portuguese, and Neapolitan seamen delight to indulge. A certain remedy for this evil will be found under the heads of "Preservation of Silence" and "Leave to the Ship's Company," in the Chapter dedicated to the Senior Lieutenant.

ropes on deck, together with the boatswain and his mates appointed to look-out aloft, can always see the movements of the men rigging the upper and lower yard-arms. The hands in the top must keep their eyes on the lower lift, and take the slack of it down as the yard ascends. In nine cases out of ten, the lower-yard-arm becomes "unrigged" from inattention to this particular.

The midshipman of the top should get his "square marks" on the lifts down, as soon as the yard is across.

CHARGE OF BOATS.

When employed on boat-service, whether in the performance of duty on shore, despatched from the ship, or alongside of another vessel, a *watchful* eye is required to be kept on his own ship. The midshipman in command of the boat will depute one of the crew to perform this necessary duty. By this precaution signals of "recall" will be instantly seen, and ships spared the shame of proclaiming, in broad bunting, their own insubordinate state. *

* How frequently during a four hours' watch have ships been seen at Spithead with Dutch ensigns at the main, French at the fore, or Spanish at the mizen; and for what purpose? To recall a lazy mid in a paltry jolly-boat.

CONDUCT TO BOATS' CREWS.

When in charge of a boat, the midshipman is enjoined to preserve his station,—to avoid familiarity with the men, or overbearing demeanour, and, above all, the application of vulgar and abusive epithets.

If from praiseworthy motives of precaution, or from superior knowledge of the localities of a port, a suggestion be respectfully offered by the coxswain, the too prevalent reply of "*Wait till your opinion is asked,*" is not to be returned. Whether rejected or not, well-intended suggestions are not to be discouragingly nor haughtily treated. Pert replies provoke pert rejoinders, and insolent and contemptuous language invariably follows. Suggestions of inferiors may be treated in a manner to ensure good will, and at once to preserve and command personal respect.

BOATS ALONGSIDE OTHER SHIPS.

Boats' crews are not to be permitted to peep through the ports,—to indulge, when alongside of other vessels, in loose language, to draw comparisons, or to descant upon the "usage" or discipline of other ships.

Should mild remonstrance be vain, the midshipman in charge should direct the boat to shove off from the ship's side,—keep the crew at some distance on their oars, and immediately, on returning to his ship, report officially the names of the parties offending.

TRANSPORTING PROVISIONS AND WATER.

In the execution of these and similar duties, the midshipman is never to resign his charge, nor, without absolute necessity, delegate to the coxswain of the boat superintendence of duty. The too customary practice of deserting the boat for the deck of a stranger, is sure to bring "trouble" on the head of the defaulter. Opportunities less subversive of discipline, or less detrimental to despatch, offer frequently enough to increase acquaintance or decrease the cockpit decanter. Nor are deck discussions, touching the relative merits in sailing, reefing, or furling, at all desirable on these occasions. Unless midshipmen remain in their boats, crews alongside become restive and riotous, and not infrequently fight for priority of place.

WATERING THE SHIP FROM THE SHORE.*

On these occasions, the midshipman, or mate in charge of the boat, should, previously to shoving-off from the ship, see the following articles placed in the boat:—wooden and canvass buckets, hoses, bungs and bung-cloth, cooper's tools, triangle and tub, grapnels and ropes, stern-fast, and tackles to hoist in with, if unable to fill by the hose. "Casks in the boat should be ready slung. If it be required to roll the casks over rocks, shingle, or deep sand, much time will be saved by pieces of spars

* "In hot climates," observes Captain Griffiths, "seamen watering are so thoughtless, and feel such pleasure while in the water, that they are paddling in and out while watering sometimes all day. They come out of the water with their frocks and trousers wet; the immense power of the sun dries, or partially dries, their dress, and in they go again. Being salt water, the evaporation leaves the salt, stopping up all their pores, as we have all often felt. Thus there is injury from being long in the water, and from their clothes drying on them * * * * The men should never be allowed to go into the water when on this duty unnecessarily, nor kept, nor *permitted* to stay longer than is indispensable. Dry frocks and dry trousers for the boats' crews should always be sent. The party of necessity *in* the water should be *frequently* relieved, and these dry things put on, their wet ones soaked in *fresh* water, wrung, and dried. In such climates they will be ready for them to put on by the time their turn has again finished." A *tent* is often serviceable.

tor 'ways' to roll on. If rocky, use snort pieces; if otherwise, long ones. Always rinse out the casks, because, if they have been long empty, and particularly in hot climates, they turn mouldy and sour."*

BOATS UNDER SAIL.

CARE should be taken that the halliards be coiled up clear for running; that the sheets be *not belayed;* and that the crew, in shortening sail to a squall, do not shift their seats, or, as is too common a custom, stand *up* on the thawts to gather-in the shaking sail. In lowering a lug or latteen sail, haul down alone on the *luff* (the fore leach); the after one were better left untouched. Coxswains should be also cautioned of the danger of *letting go the helm.*† This is often inadvertently done,—sometimes to

* Griffiths's "Practical Hints."

† The author, when a youngster, was in this manner capsized, in one of the Barfleur's boats, on "Plymouth Bridge," before the Breakwater was even contemplated. It blew a heavy gale from the southward; the ships in the Sound had lower yards and topmasts struck. The boat was a six-oared cutter, carrying a mizen forward, set as a foresail, and a close-reefed foresail abaft, set as a mainsail. Under this sail, the cutter had behaved inimitably well, and had just succeeded in crossing the most dangerous part of the reef, when the coxswain, to get a *pull* of the main sheet, *let go the helm,* and the boat, flying up in the wind, and becoming

secure the heel of the bumpkin, or to get a pull of the main or the mizen-sheet. By this thoughtless practice, boats are liable to fly up in the wind, the sails to be taken aback, to be difficult to lower, and eventually to cant over, and "capsize" to windward.

SALUTE SUPERIOR OFFICER.

WHEN pulling, and passing a boat in which a superior officer may be seen seated, the midshipman should move his hat from his head, at the same time directing the boat's-crew to toss-up their oars in token of salute. If under sail, the boat's-crew are to be directed to lift their hats, taking the time from the gentleman in charge of the boat.

BOATS PULLING ON A LEE TIDE.

WHEN boats, on a *lee*-tide, are seen pulling in the wake of the ship, the circumstance is to be

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aback, capsized over to windward before there was time afforded to lower the sails.

The accident occurred at *sunset* in the middle of the month of November. The captain's steward was drowned, and considerable property, belonging to the present Admiral, Sir George Martin, was lost. The Barfleur's boat's-crew were upwards of fifty minutes in the water, in consequence of the delay and difficulty in receiving assistance from the ships in the Sound.

reported to the officer-of-the-watch, who will direct a buoy and towline to be veered to their aid astern.

The midshipman-of-the-watch will be required to have in readiness on the gangway "fresh boat-keepers," to relieve the wet and fatigued bowmen the moment the boat arrives alongside.

BOATS'-CREWS ABSENT AT MEALS.

SHOULD pressing duties or unforeseen occurrences occasion, during meal-times, the absence of any of the boats from the ship, the mate-of-the-watch should send to the cook and mate-of-the-lower-deck a list of such absent people, in order that their victuals may be kept warm and their grog be put apart from the mess allowance. And should boats be away from the ship after the time appointed for "piping down hammocks," those pertaining to the absent men are to be carefully taken below, and *hung* up in their proper berths. The inconsiderate cry of "*Send up* Jackson's or Johnson's *messmates* to take down his hammock," should never be resorted to. The custom is manifestly bad, inasmuch as such privateer-like shouts always produce "more

noise* than work." Moreover, upon such occasions "every body's business is *no* body's business." People should be especially appointed for this purpose.—Vide "*First Lieutenant*," under the head of "Stationing."

BOAT—GIVING A ROPE TO.

WHEN a boat from a lee-tide or running sea requires from the ship the aid of "a *rope*," care must be taken that the towline be passed as far *forward* as possible. The position of the fore-channels is too far aft, and causes too short a scope. The towline should be "passed from the cat-head, with a slip-rope to the crown of the spare or sheet anchor, which, when slacked, when the bowman secures the towline, the boat will ride with a good scope"† and with comparative ease.

CAUTION.—The towline should never be made fast to the ring in the bow of the boat. It should be passed through the ring, by way of "fair-leader,"

* When the punishment of "mast-heading" was preserved in the penal code, the author served in ships where these indiscriminate cries were invariably followed by a trip to the cross-trees.

† Captain Griffiths.

and eventually secured to the slings hooked to the bottom of the boat.

BOATS—WHERE BEST MOORED.

Boats are best moored at the guess-swamp-boom. In this position, they ride under the eye of the officer-of-the-watch, and are less liable to damage than when secured alongside, or moored astern. Boat-keepers, unless especially called to assist in the execution of urgent or *heavy** service, should never be permitted to leave their boats.

BOATS—TO BE SEARCHED.

To prevent purloining the stores of the ship, an improper appropriation of the people's clothes, or a clandestine introduction of liquor on board, all boats proceeding from the ship to the shore, and *vice versa*, should be strictly searched.† The coxswain should

* Such as swaying up lower yards and topmasts. In a small vessel, with a "short-handed" complement, the practice may be tolerated.

† Whilst the master-at-arms or the ship's corporal are made to examine the persons of people ascending the side, the boats pertaining to the ship are seldom or ever searched. Were the truth told, many a tale of trouble might be traced to the captain's cloak bag.

be made to examine his boat, and report the result of his search to the officer-of-the-watch, before she be permitted to drop astern, or haul-off to the guess-swamp-boom.

BOATS—LOWERING DOWN.

In lowering boats from the quarter or the stern, care must be taken that the moment the bottom touches the water, the *after*-tackle be quickly disengaged from the slings. If, in a tides-way, this precaution be not observed, the probability is, that the boat will immediately fill, the geer in the "drift" be eventually lost, and the men in the boat be exposed to imminent peril.

Hint.—The boat's plug should be always attached to the bottom boards by a light lanïard or small "nettle."

BOATS—COXSWAIN'S REPORTS.

It should be a standing rule, whether at sea or in port, that at sunset, or immediately after quarters, each coxswain report to the mate-of-the-watch, his boat *clear*, and ready for hoisting out, or lowering down.—In warm climates, the coverings of the

boat should be taken off, in order that the dew of the night should prevent the leakage consequent on the splitting of the planks.

BOATS—SENDING ON DISTANT SERVICE.

MEMORANDA *of articles required for distant service* :—" Spy-glass—quadrant—navigation book—compass—pencil and paper—chart—watch—lead and line—tinder-box—grapnel and rope—stern-fast—hammer—nails—spike for guns—spare rope, size of boat's geer—spare tiller—spare oars—blue lights—lanthorns and candles—casks or kegs for water—ditto with *scuttle* for bread—arm chest—flints—turn-screw—tourniquets—great coats—muffling for oars—fishing lines—iron-pot—fuel; each man a knife—an axe—a maul—a crow—needles—twine. Colours of the nation on the coast employed."*

Griffiths's " Practical Hints."

AT SEA.

DIFFERENT stations will be severally assigned to the midshipmen composing the watch. To one will be given the charge of the poop; to another, that of the forecastle; and the remainder will be called upon to assist in the immediate duties of the quarter-deck.

THE POOP MIDSHIPMAN.

THE cordage, canvass, and furniture pertaining to the mizen-mast and poop, will be under the immediate eye of this officer. He is required to superintend all duties incidental to that deck; and he becomes responsible for every occurrence that may there transpire during his interval of watch.

He should not permit unnecessary noise over the captain's head, nor aught of disorderly conduct on the part of the mizen-topmen and marines abaft. He should see that the quarter-boats contain no more than their proper proportion of geer and spars; that they be kept free from lumber; be properly secured, and be perfectly clear for lowering. He should also see that

THE LIFE-BUOY attached to the stern be in perfect readiness, and particularly that its *night-apparatus* be primed, and in proper order.*

Unless especial permission be given to that effect, he will prohibit washed or wet clothes to be suspended from the shrouds, but particularly from the guys or geer of the quarter-boats.†

ORDER OF SAILING.

ATTACHED TO A FLEET.—Should the ship compose part of a fleet or squadron, formed in the order of sailing, the poop midshipman will be re-

* Vide GUNNER.

† The author witnessed the loss of an excellent and worthy seaman, in consequence of a marine's shirt having been stopped-on to one of the falls of the lee quarter-boat.

quired to keep a constant look-out on the next ship in succession astern; and, upon every occasion, report to the officer of the watch her relative change of position, and her "drawing up or dropping astern." All increase or diminution of sail should be also reported to the officer-of-the-watch. Attention to this duty becomes indispensable in the preservation of the ship's station in the line.

SAILING BY THE WIND.

THE poop-midshipman will see that the mizen-topmast and top-gallant sheets be close home; that the sails be taut-up; the bowlines hauled, and the weather-braces well in. He must never permit the weather-peak vang to be kept fast, nor the *lee*-top-and-lift of the driver to girt the sail.

CAUTION.—In squally weather the lee throat brail* of the driver should be kept in perfect readiness, and its end pointed down on the quarter-deck. Previously to brailing-up, the lee cross-jack brace should be slacked, and the weather one

* In some ships the throat-brails are led forward to the main-bits on the quarter-deck.

rounded in, so as to prevent the driver coming in collision with the lee cross-jack-yard-arm, and thereby fouling or splitting the sail.

WIND AFT, OR GOING LARGE.—The cross-jack yard should be trussed to, previously slacking the braces, to permit the yard to close with the mast; the topmast breast-backstays to be set-up on both sides.

Should the wind be directly aft, the driver-boom sheet, guys, and both peak-vangs should be set steadily taut.

TACKING WITH THE WATCH.*—The poop midshipman becomes answerable that the lee-main, main-topsail and top-gallant braces be clearly coiled for running, and that the men appointed to attend these ropes be ready in their respective stations. On hauling the after-yards, he should "give an eye" to the breast-backstays, see that those on the lee side be "bore" abaft the top-rim, and that the weather ones be well set-up when the ship is on an even keel. He should wait till the after bowlines be hauled, before he set taut the weather-braces.

* Vide OFFICER-OF-THE-WATCH.

WEARING WITH THE WATCH.—In the performance of this evolution, much will depend on the skilful management of the main yard.* The poop-midshipman should therefore place a practical and experienced hand to ease and attend to the *lee* main-brace.

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* Vide OFFICER-OF-THE-WATCH, "Practical Hints."

SIGNAL MIDSHIPMAN.

PRELIMINARY REMARK.

NOTHING will sooner procure for a vessel-of-war the popular reputation of "a smart ship," than a constant and vigilant look-out for signals. Indolence, or tardiness in the performance of this particular duty, promise little of alacrity in the execution of service more essential. But a signal midshipman should not be too anxious to retain this station; because, if he continues, for a year or two, to give that exclusive attention to this office which is necessary to its due discharge, he must forego the acquirement of more important knowledge.

GENERAL DIRECTIONS.

THE Signal Midshipman will be required to keep a constant and cautious look-out on the Flag or Senior Officer's ship; to answer with celerity signals when *discerned;* but on no account to answer any general or telegraphic combination until *every* symbol composing it be distinctly seen; nor, in his endeavours to distinguish signals from distant ships, is he to *imagine* colours, *anticipate* purports, or in any way to permit *thought* to occupy the place of *sight.*

Indications of evolutionary movements, however trivial they may seem in their nature, are to be reported in time, and the officer-of-the-watch made

acquainted with the precise period their execution commences.

The signal midshipman occasionally should visit, in his watch, the several signal halliards rove, fore-and-aft the ship,—see that they be clearly coiled, and kept in perfect readiness for use,—that in wet weather they be slacked, and, whenever they require renewal, they be properly stretched before rove; that the flags be "made-up" in one undeviating form—toggles clear, "taut in the skin," and in as small a compass as possible; that the distant lines be all equalized according to the established length, and that the eye of each be fitted with a copper thimble.*

The signal midshipman should never permit the idle and tardy practice of hoisting signals "hand-over hand," nor allow the bight of the line to be taken *across* the deck. By leading one part of the halliards on each side of the ship, and having a detached "tack" coiled clearly within a small portable tub, and to bend on as occasion may require, any number of flags, by means of a small

* He should apply to the First-Lieutenant to give the necessary directions to the armourer.

snatch-block, may with celerity be run up to the mast-head, best suited to display the combination complete. *

The signal midshipman, whether at sea or in port, will be required to keep a Signal Log, according to the following form:—

FORM OF SIGNAL LOG.

Signal Log of His Majesty's Ship ———.

Date.	Time.		Made				
The month	A.M.	P.M.	By whom	To whom	General.	Telegraphic.	Remarks.

* "Signals should not be hoisted *close* up to the truck. The eddy wind from it, and more so from a vane of the mast-head, are very apt to prevent the upper-flag from blowing out."—*Practical Hints.*

IN PORT.

THE Signal Midshipman should never permit the movements of the Admiral to take him by surprise. A sharp and seamanlike eye will quickly detect preparatory signs. "Hands stealing aloft" to overhaul the top-gallant-rigging will indicate the senior officer's intention to fid top-gallant masts; "overhauling down lifts and braces," to cross top-gallant-yards, and "unclamping" the lower booms, will be a certain sign of the contemplated movements of either loosing or of mending sails.

True it is, that such preparatory signs originate usually with the foremast-men; but he whose sight and intellect are equally acute, will do well to remember the old saw of Seldon:—"the throwing

up of a straw in the air, will indicate the exact position of the wind."

The signal midshipman should also keep an occasional look-out on the flag-staff ashore; nor are the movements of other ships to be disregarded. All vessels, mooring or unmooring, weighing or coming to an anchor, should be reported to the officer-of-the-watch.

Should the flags be in want of repair, he should report the circumstance to the senior lieutenant; and whenever they become damp, or wet, or require exposure to the air, he should obtain permission to hoist them up.

AT SEA.

ATTACHED TO A FLEET.—The eye of this officer, or of that of the signalman, should be constantly placed upon the ship of the Admiral or Senior Officer; and he is enjoined to observe at sea (though, if possible, with more of vigilance) the same injunctions touching preparatory motions, which he has been already directed to observe "in port." But he is particularly reminded to report to the officer-of-the-watch the most minute movement, or alteration of sail, made by the Commander-in-chief.

SIGNAL BOARDS.

HE will be held responsible for the preservation of the several signal-boards, such as ship's "distin-

guishing pendants" — "vanes" — "orders of battle, and of sailing;" and he will be careful to record on the signal-slate the time, the number, and character of every signal which may be made during his watch.

TELEGRAPHIC SIGNALS.

In making telegraphic signals, the *signalman* should invariably note down the letters required to complete the words of each sentence. From similitude in the sound of such letters as P, T, V, M, N, mistakes constantly occur. Nor is the practice of "*delivering letters*" at a distance at all to be encouraged afloat. In plain parlance, the signal midshipman is cautioned against "*singing-out*" letters from one end of the ship to the other.

SIGNAL BALLS.

The best kind of signal-ball is that made with two hoops to *shut* in a flat form. These balls should never be blacked with *tar* or "blacking," but be properly painted. They should be fitted with swivels, and kept in the mizen channels, stopped neatly up, and close to the ship's side.

INDICATING DIRECTION OF STRANGE SAIL.

SHOULD a strange sail be descried from the mast-head, and it be desired to indicate her position by signal, care must be taken that the exact bearing by compass be given to the admiral.

PREPARATIONS FOR NIGHT SIGNALS.

AT sunset the following preparations should be observed for making signals at night:—

The triangle to be traced-up to the mizen-peak; the lanthorns to be inspected; the lamps to be trimmed, and "candles matched;" two guns to be unshotted on each side of the main-deck;* rockets and blue-lights to be inspected in the cabin, and the stand of the one, and holder of the other, to be placed in readiness on deck. The signal-midshipman should also remind the captain to look out for the night private signal.

MAKING NIGHT SIGNALS. — Whenever it be required to make night signals, the lighted lan-

* In some ships, two guns on each side on the main-deck have their breeching-rings painted white, to denote them as signal-guns. This is a good arrangement, and prevents mistake.

thorns should be kept covered in their tubs, until preparation be made to shew or hoist them simultaneously. Care should be taken that no other lights be seen from the ship, and that *spare* lanthorns be kept lighted to supply the place of those which may be extinguished by the wind, or the motion of the ship.

FOG AND SIGNAL GUNS.

When signals are made through the medium of *sound*, it is of the utmost importance that the interval between each "report" be correctly noted. This is too often neglected.—Vide *Flag-Lieutenant.*

RECONNOITRING A PORT.

"The sketch of the port may be taken off without difficulty, from the coasting pilot or charts, against a window. The position of the vessels laying therein must be laid down at the moment of reconnoitring."

If unacquainted with the place, "examine the chart, to see what will be the best bearing to obtain the fullest view, so as to have the shipping clear of headlands, islands, forts, or large buildings.

Compare the height of the masts of those whose hulls cannot be seen, or seen distinctly, with those that can, bearing in mind the state of the tide as to height: by this, any difference may be observed on a future reconnoitre, should any of the enemy's vessels be in a wet dock or basin.

"Observe if sails are bent; if light or deep; guns in, or not; (these may often be discovered by the sun throwing their shade on the paint;) whether few men on board; if clothes or hammocks are drying:* whether riding by their own cables; (the bower anchors will shew this;) if launches are in or out." †

CAUTION.—If reconnoitring when the wind is to the eastward, the signal-officer must make allowance for the state of the atmosphere; and bear in mind that, with an easterly haze, objects become deceptive to the eye, and frequently assume a variety of forms.

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* From the clothes, and hammocks, the number of men on board may perhaps be inferred.

† Griffiths's "Practical Hints."

FORECASTLE MIDSHIPMAN.

AT SEA.*

THE physical faculties of this officer should unceasingly be held in readiness; the most acute of his senses—those of sight, scent, and hearing—will constantly be put to the proof. The "sharp look-out before," the steady standing of the jib and boom, and, above all, the systematic readiness of running ropes, will fully testify the sharpness of the first; the "*condition* of the *head*" will give ample evidence of the sensitiveness of the second; whilst

* Nothing is here said respecting the duties of the Forecastle Midshipman in Port, inasmuch as the demands on his attention in harbour are few and trivial.

prompt compliance with commands from the quarter-deck will afford "proof positive" of the quickness of the third.

Like the gentleman abaft, the officer forward will be held responsible for every act and deed performed on the forecastle. He will observe the same injunctions touching the unsightly system, the privateer practice, of hanging clothes promiscuously to dry in the rigging; and be cautious that none of the crew lounge, skulk, or sleep in the forechannels; that neither ropes nor woollen clothing be suspended from the bows, and that no hides be towing alongside, in soak, without especial permission from the officer-of-the-watch.

LOOK-OUT MEN.

On no occasion are look-out men (but particularly those planted at night) to be called from their posts to "let go" or "clap on" a rope.* Such momentary absence may be the immediate cause of serious disaster; possibly, of destruction to both the ship and the crew.

* This reprehensible practice has become too prevalent on the peace establishment. The "*short-handed*" excuse will be found to be a poor apology for the *short-sighted* disaster.

ORDER OF SAILING.

ATTACHED TO A FLEET.—When sailing in line, the forecastle midshipman is to keep a vigilant look-out on the ship next in succession *ahead*,* and, upon every occasion, to report to the officer-of-the-watch the "drawing-up" or dropping of his own. If the ships ahead increase or shorten sail, he should also acquaint the officer in charge of the deck. His attention, however, is more particularly directed to the next in line *ahead*, or, to be more explicit, the immediate leader of his own ship.

SAILING BY THE WIND.

HE should see that the fore-tack be close down, the sheet aft and properly shrouded, the head-bow-lines well hauled, the weather fore-lift and truss bowsed taut, the breast-backstays set up, the fore-topsail yard well in, and its weather lift properly taut.

If squally weather, he should see that the jib-guys are well-up, and that each bear an equal strain. He should keep a watchful eye on the head-sails,

* Vide OFFICER-OF-THE-WATCH.

report in time complaining spars, and have the jib-down-haul and weather fore-topsail clew-line laid clearly along, with their ends pointed down in the waist.*

Note—When the top-gallant sails are to be taken in, he should not start the *weather* sheet until the yard be clewed closely down.

In hauling down the jib, a steady hand will be required to attend the sheet; and care should be taken that the sail be properly spilt before hands be sent out on the boom to stow or stop it.

In light winds and moderate weather, the jib must not, for a moment, be permitted to hang supinely beneath the boom; the sight carries with it an unseemly, slovenly appearance, and bespeaks something like laziness on the part of the people forward.

WIND AFT, OR GOING LARGE.—Should the wind be aft, or the ship going large, care must be

* When the jib is set, care must be taken that the stay be well-up, and that the sheet be neither too flat nor too flowing. When the jib is stowed, care should be taken that, in strong breezes, *wet* weather, and particularly if a *head*-sea be running, the *stay* be thoroughly slacked. Booms, before now, have been sprung solely from the circumstance of keeping fast the jib-stay when ships have been pitching in a head-sea.

taken that the breast-backstays on both sides be well up, that the fore yard be trussed closely to, and that each fore lift be set well taut. Should the ship roll, the rolling tackles* hooked aloft are not to be forgotten below.

HINT.—The captain of the top is to report to the officer-of-the-forecastle, that the out-riggers, coiled-up geer, and implements of the top are securely placed.

SETTING STUDDING SAILS.

TOPMAST AND TOP-GALLANT.—The moment the preparatory words "Stand by to rig-out† topmast and top-gallant studding-sail booms!" be given, burtons are to be brought down from the topmast heads, hooked to the topsail yard-arms, and bowsed

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* The rolling-tackle should be a luff-tackle purchase, the single block hooked to a strap round the yard, the double one to an eye-bolt in the lower cap, the fall leading down on deck.

† In rigging-out the topmast studding-sail boom, a jigger with two tails is generally used; the outer tail-block is secured to the neck of the boom-iron, and the inner one to the heel of the boom; the fall is then rove through a leading block, and sent down on deck. When the boom is rigged out, the heel-lashing is passed to secure the boom. The jigger is a gun-tackle purchase.

To *rig-in*, the tails of the jigger are shifted; one is secured to the slings of the lower yard, and the other attached to the bolt in the heel of the boom. Before rigging-in, cast off the heel lashing.

well taut, pending preparations for rigging-out the booms. As soon as the booms are out and the studding-sails run sufficiently high to clear the brace-blocks, and to permit the yard-arm-man to cut the stops that encircle the sail, a rapid run together with the halliards and tack,* and due attention to the inner leach, will ensure the studding-sail yard ascending abaft the topsail. When studding-sails are set on both sides, the *lee* one is to be set *before* the sail.

IMPROVED METHOD.—Strap a thimble to the studding-sail yard, about one fourth from the upper or outer extremity; fit a lizard on the halliards, reeve it through the thimble on the yard,†

* One or two ships in the war were wont to bring the topmast-studding-sail *tack* in *along* the lower yard, top-gallant-sheet fashion, and to fit the boom brace with a short pendant and a whip purchase. In trimming sails, the advantage of this method is manifest:—the yards may be braced forward without touching the *tacks*; the braces alone require to be eased.

If, in a strong breeze, the wind be too far forward to permit the lower studding-sail to stand, a martingale to support the topmast studding-sail boom may be converted out of the lower studding-sail halliards, thus:—Clap a temporary toggle on the lower halliards, lead the under end through one of the scupper-holes on the main-deck, secure it in board, and bowse well taut on the *hoisting* part.

† The lizard is fitted upon the same principle as that of the top-gallant-yard.

pass it three or four times round the halliards and yard, and hitch it to its own part with the bight just below where the halliards are bent.

The stops or "ties" being all off, sway the studding-sail above the brace-block, when the man on the yard will have only to pull on the end of the lizard, throw-off one or two round turns, and the studding-sail yard will fall in its proper horizontal position. The sail should then immediately be run-up to the yard arm, the man stationed on the yard guiding the inner leach in its ascent aloft.

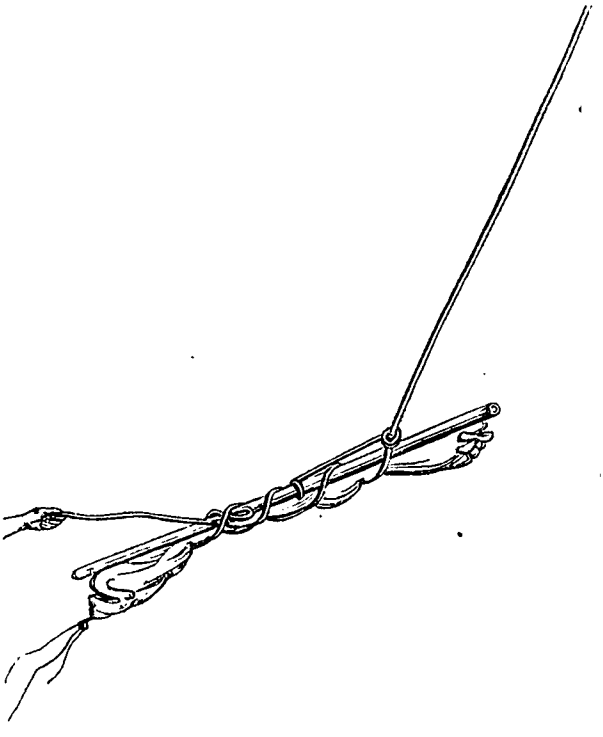
To dispense with the use of "stops" below and knives aloft, sinnet or nettle "ties" should be attached to the studding-sail yard.

The sketch on the opposite page represents the mode of fitting and passing the lizard.

LOWER STUDDING SAIL.

In ships that dispense with the use of the sprit-sail yard, the operation of "getting-out," or rather of hauling forward the swinging boom, not infrequently becomes a tedious and troublesome task,

LIZARD, AS PASSED ROUND THE TOPMAST STUDDING-SAIL.



the result of the extreme acuteness of the angle which the fore-guy * forms on the *first* hauling of it forward. To counteract this, and to obtain for the guy the requisite angle to rouse forward the boom, some ships purposely affix a jaw to a light and lengthy spar, which, protruding out of one of the main-deck ports, with a push or two from three or four of the stoutest gunners in the waist, produces instantly, while topping on the lift, the preliminary *start* which the guy so much requires.

When the boom is athwart, and trimmed with the fore-yard, the outer halliards and tack are to be well manned, taking in the slack of the inner halliards as the sail goes over the gunnel; and ultimately reaches its destined height. In running away with the lower-halliards, care must be taken that the yard be not brought-up with a *jerk* against the topmast-studding-sail

* The fore-guy is spliced round, or sometimes into an eye-bolt, to an iron hoop round the boom; the end is then taken forward, and rove through a single block strapped into a bolt in the bowsprit cap, and led in on the forecastle. Ships without spritsail yards sometimes attach a leading block to the outrigger at the cathead.

boom; by this sudden jerk, booms are constantly sprung.

TACKING WITH THE WATCH.

In assisting in the execution of this heavy but rapid evolution, the midshipman of the forecastle will be, in a great measure, governed by the sail that is set. The moment that the brief order, "*'Bout ship!*" * escapes the lips of the officer-of-the-watch, the men stationed to "stand by ropes" should immediately *run* to their appointed places. But attention is particularly directed to the indispensable necessity of seeing that the main-top-bowline and top-gallant-bowline men are instantaneously in their respective stations. By keeping fast, or fouling either of these running ropes, considerable damage may ensue; nor are the head-sheets, fore-tack, head-

* It were desirable that the customary interrogatories of "*Ready for'ard?*"—"*Ready abaft?*" were oftener disused in the service. A ship's company should be accustomed to "put the ship about" with as little notice as possible. This system will always tell on the sudden discovery of danger. The writer served as First-Lieutenant of two ships in which, upon the occasion of tacking, no preparatory time was allowed. When the officer on deck gave directions to "turn the hands up—about ship," the helm was put down, and the people never failed to be up in time at their respective stations.

bowlines, backstay-falls, spritsail, and lee fore-top-gallant braces the less necessary to be attended to. The men stationed in the top are to overhaul the lee lower lift and trusses. The latter service should be performed without any auxiliary hail aloft from the forecastle.—Vide *Officer-of-the-Watch.*

WEARING WITH THE WATCH.

As wearing is a less rapid evolution than that of tacking, the keeping fast of "stand by" ropes is not so productive of mishap. The fore-tack, however, must be raised, and the head-bowlines "let go," the moment the word be given by the officer abaft. The same directions touching lifts, trusses, backstay-falls,* &c., are to be observed as in tacking.

REEFING WITH THE WATCH.

THE primary step in the execution of this too-frequently procrastinated service will be to clew the yard down close to the cap, to round in sufficient

* In some ships the "breast-backstays" are brought further aft, and, like the quarter-backstays, are set up "standing." This plan is approved by some of the first seamen in the service.

of the weather-brace to permit the topmen to reach with facility the quarter of the yard from the weather-rigging, and to employ every exertion to spill the sail before "sending the people aloft." To effect this, and to save time, the officer forward will thus proceed:—

At the moment of lowering the topsail, request from abaft a check of the lee fore-brace; run away with the weather clue-line; clap plenty of hands on both bunt-lines, and, when the yard arrives on the cap, haul out the reef-tackles, (weather-one best.) By attention to these points, the officer will speedily spill the sail, secure the yard, and may safely order his men aloft. The earing-men to be cautioned to pass properly and secure the earings, and the remaining top-men to tie their respective points clear of the top-gallant sheets.

Note—It should be an invariable rule, that when the third reef be taken in the topsails, the preventer-braces be "clapt-on the yards."

REEFS—SHAKING OUT.

SETTLE sufficient of the topsail-halliards to counteract the effect of the lee-leach on the weather-

brace; round in enough of the latter to clear the points of the lee-rigging. If with "treble-reef" topsails, check the lee fore-brace, set taut the reef-tackles, cast-off the points as the men lie out on the yards, and care must be taken that the earings, which are to be eased down *together*, be not disengaged until every point in the reef-band be detached from the yard. The keeping fast of a solitary point, is more likely to split the sail than the entanglement of ten. In some instances it is desirable, in shaking out reefs, to set taut the buntlines.

STRIKING TOP-GALLANT YARDS.

TOPMEN to be sent aloft, to unreeve the top-gallant studding-sail, and unbend the top-gallant geer; to untoggle* the top-gallant halliards; stop the yard-rope out to leeward, and attach to the

* The top-gallant halliards are thus "toggled:"—Take within a few feet of the cross-trees a round turn of the yard-rope round the strap of the upper block, fitted for the purpose; pass the bight of the former through the eye of the strap of the latter; toggle the bight of the yard-rope; then pass its end through the lower block, lashed to the head of the lower rigging; lead it up again through the upper block, toggled on the tie-part of the yard-rope; then down on deck; and, finally, through a leading block on the forecastle, or a sheave in the bits.

lower yard-arm a tripping-line, which should be led through a tail-block, secured to the weather cathead.

CAUTION.—Should the ship be rolling heavily, or pitching in a head sea, care is to be taken that a turn or two of the parrel-lashing be kept fast till perfectly ready for tripping the yard.

STRIKING TOP-GALLANT MASTS.

FROM impropriety in practice, the operation of striking top-gallant masts not infrequently becomes a troublesome task.

The system so often pursued of hauling, or rather "*swigging down*," on the weather backstay, is subversive of the purpose desired. By this unmeaning practice the mast becomes bound in the tressle-trees and cap, and consequently difficult to lower.

To produce the desired effect, proceed thus:—Overhaul, first, the flying-jib halliards, lee-rigging, and top-gallant yard-rope;—if blowing hard, and the ship be leaning over to leeward, care must be taken that the laniards of the weather-shrouds

be not *overhauled*,* and that the weather-backstays and top-gallant and royal stays be eased handsomely by hand;—sway then on the mast-rope; as soon as the fid is out, man immediately the top-gallant yard-rope and flying-jib halliards, and place hands to gather-in a steady strain on the weather backstays and top-gallant and royal stays; then lower away, hauling best down on the yard-rope and flying-jib halliards; the latter ropes will act as perpendicular purchases, and produce the desired descent; the heel of the mast should be secured, and the rigging hauled taut down in the top.

Note—Topmen aloft should never be permitted to sing out aloud, "*high enough!*" or "*lower away!*" A wave from the hand aloft, directed to the boatswain or mate looking out for the mast below, will answer every possible purpose, and produce that silence† so essential in the execution of every service.

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* Unless the shrouds be rendered unusually taut by rain, there need be little or no necessity to slack the *weather* rigging with "*wedge-fids*."

† No people deride unnecessary noise more than British men-of-war's-men; witness their jokes when in company with Portuguese or Neapolitan vessels.

MATE-OF-THE-WATCH.

IN PORT.

For the efficient discharge of all subordinate duties the mate-of-the-watch will be held responsible. During the night, he will see that a midshipman in turn visits periodically the several centinels at their respective posts; direct a vigilant look-out to be kept around, and a watchful eye on such boats of the ship which, from circumstances, may unavoidably be moored astern, or secured alongside. The latter caution refers to port practice, when a crew is "hulked," or the ship deprived the means of hoisting up, or hoisting in, her boats.

He will also see that a midshipman "goes the general rounds;" visits, every hour, the orlop and different decks, and that the young gentleman returns his report to the officer-of-the-watch. Unless previous permission be obtained from the quarter-deck, lights are not, after gun-fire, to be allowed below; nor are stragglers to be seen out of their hammocks, lying or lounging on the decks.

HINT.—Defaulters may be admonished, and quietly ordered to their beds, with something of tact and temper on the part of the admonitor.

In conjunction with the quarter-master, he should attend to the hawse, and to the turn of the tide; while, to ensure the ship's swinging the "right way," he should give timely notice to the officer-of-the-watch. *

FRESHENING HAWSE.

WHEN, from bad or boisterous weather, the hawse requires to be freshened, the circumstance is to be made known to the master, in order that he may superintend, in person, the careful execution of this service.

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* Vide OFFICER-OF-THE-WATCH in Port.

SHEET-ANCHOR WATCH.

On these occasions the mate-of-the-watch should report to the officer in charge of the deck, the deep-sea lead over the side; that axes, bars, and other implements for disengaging the anchor are ready at hand, and that the men stationed to stand by them are at their respective posts.

AT SEA.

He will assist the officer-of-the-watch in the performance of all *executive* duty, repairing to whatever part of the ship his services are most needed. By night he will superintend the duties of the waist;* that is, when ropes are led, or worked on that deck.

MUSTERING THE WATCH.

In some ships this *muster* is turned to *double* account; the system is extremely simple, and is

* The practice of leading and working ropes in the waist is now seldom resorted to. In wet weather, with a well-sanded deck, a jib down-haul, or topsail clue-line, may be worked in the waist with considerable advantage.

strongly recommended as working well. The principle is that of calling *stations*, instead of answering to numbers or names.

In his night "Order-book," addressed to the mate-of-the-watch, the first-lieutenant assigns to each watch a specific evolution. For example:—

"Jan. 1, 1835—H.M.S. *Matchless*, at sea.

"STATIONS TO BE ANSWERED DURING THE NIGHT.

"Samuel Smart, First-Lieut.

"First watch, answer to *Furling sails.*

"Middle watch - - - *Shifting topmasts.*

"Morning watch - - - *Reefing topsails in stays.*"

When the people are assembled aft to muster, the mate-of-the-watch announces the given evolution. At muster in the *first* watch, he says, "Answer to *furling sails.*" He then commences, "Francis Fish." Francis Fish is captain of the forecastle of the starboard watch, and answers, "*Bunt, fore-yard.*"

At muster in the middle watch, the mate cries, "Answer to *shifting topmasts*"—"Henry Hawse." Henry Hawse is captain of the forecastle of the larboard watch, and answers, "*Reeving fore-top-tackle fall.*"

. At muster in the morning watch, the station is "*Reefing topsails in stays*"—"Francis Fish." Francis Fish answers, "*Weather reef-tackle, fore-tack, and bowline ;*" and so will every man in succession *call* his station according to the evolution given.

MARKING THE LOG-BOARD.

It would be difficult to name any official record or public document which is more constantly called for, or more frequently appealed to in disputed points, than the log-book* of a vessel-of-war. Yet, singular as the assertion may seem, (though, indeed, anomalies have long appeared to flourish afloat,) no public register is so faulty in its notation of time, so careless of construction, or so truly unimportant in "remark," as those which are cautiously treasured in the archives of Somerset-House.†

* The log-book is a literal copy of the "Board." "In the event of courts-martial taking place, and a variety of other cases, of what importance this record becomes!'

† It will scarcely be credited, that, during one of the most turbulent and alarming periods which have been recorded in the pages of English history, not a *single syllable,* in allusion to the state of anarchy afloat, is to be found in any of the log-books of those vessels-of-war whose crews were at war with the government of their country. This is not mere assertion. To establish this truth, the author of these pages has spent many a dull and dreary hour in the "cobwebbed cellars" of Somerset-House.

"Would it be too much to say," observes the author of 'Practical Hints,' "that, influenced by unavoidable circumstances, there perhaps exists scarcely a single *correct* log-book, recording any transaction of moment.

"Whatever will tend to improve it, and to obviate its accustomed errors, must be desirable: For this purpose, let the log, whether in sight of land or not, be regularly hove; the bearings of the land to be set at least twice in the watch;* *every* alteration of sail to be noted; and, to enable it to be ascertained what sail the ship was under at any given time, insert at noon and at eight P.M. what sail the ship had then set. The barometer and thermometer may be added at the same hours.

"The state of the weather and atmosphere are of equal moment; and yet whenever these are not of a positive marked description, examine the logs

* Captain Griffiths recommends every *hour*, but twice in the watch is generally considered sufficient; moreover, if in a fleet, the bearings of the Admiral, and (when in the *weather* column) the leader of the lee line are required to be recorded once or twice in a watch. Were the names of some headlands that could be mentioned on the coasts of Spain, Ireland, and Scotland, to be twenty-four times written on the board, there would be little room left for the insertion of important "remarks."

of half-a-dozen ships in company, and they will probably all differ. It will be difficult—perhaps impracticable—to lay down any absolute rule as to the state of the wind. The following is merely offered for consideration, with the hope it may tend to promote a nearer approach to a general understanding upon the subject. To designate the force of the wind, under this arrangement, it is to be considered that the estimate supposes the ship to be close-hauled.

LIGHT AIRS, are unsteady flaws of wind.

LIGHT BREEZES, when these have become steady.

MODERATE BREEZES, when all the flying-kites may be pleasantly carried.

FINE BREEZES, when they may still be carried, but requiring a look-out.

FRESH BREEZES, as *much* as can carry single-reefed topsails and top-gallant sails.

STRONG BREEZES, double-reefed topsails, jib, and spanker.

MODERATE GALES, treble-reefed topsails.

FRESH GALES, close-reefed topsails.

STRONG GALES, under close-reefed main-top-sail.

HARD GALES, under storm staysails.

"In the absence of any general classification of weather, this may be useful. In adopting it, some judgment must be used, because the state of the *sea*, as well as of the *wind*, must influence the sail that can be set. The effect of wind and weather will be differently viewed between a sloop-of-war and a line-of-battle ship."

HEAVING THE LOG.

To detail the dangers and disasters to which a ship may be liable from carelessness in the important operation of heaving the log, would require a distinct chapter. It is true that the "dead reckoning" is seldom unchecked by other data, and that people who perform long voyages, and who trust to astronomical observations, pay but little regard to the "run" given by log. The naval astronomer, with his chronometer, sextant, and "Nautical Almanack," and with the sun, moon, and stars unobscured, feels for a time independent of the log; but of what avail is astronomical knowledge, if, towards the termination of a passage, when pushing for a port, the heavenly bodies become invisible to human eye? This is a circumstance by no means unusual,

in temperate climates, for days and nights together, particularly on approaching the *land*. At periods like these, even the astronomical navigator must lay aside the watch and sextant, for the ruder instruments of the lead and log. Let him, therefore, not affect to despise the log; and, moreover, to bear in mind, that an incorrect return of the ship's periodical "run," may be the sole and immediate cause of her total loss.

The mode pursued by ignorant and indolent people in heaving the log is thus:—

The "strike of the bell" catching the ear of the moping mate, he rouses himself, and repairs abaft to heave the log. To assume an air of official smartness, as also with a view to impress his superior, in charge of the deck, with a favourable opinion of his punctual observance of duty, he cries in a loud and authoritative tone, "Quarter-master, hold the glass!—mizentop-men, the reel!" The glass and the reel are already in hand; the holder of time awaiting some minutes the word, which is to set the seconds in motion. As soon as the mate is securely seated, and has coiled ready in hand the necessary quantity of stray-line, to clear the

dead-water in the wake of the ship, he and the quarter-master interchange the *same* words, in asking and answering the same question.

"Clear glass?" asks the one;

"Clear glass!" answers the other.

Overboard goes the log-ship. "Turn," cries the mate, as the "stray-mark" passes through his outer hand; "Turn," responds the quarter-master, suiting the action to the word, and inverting the glass by a timely turn of the wrist. "Stop!" calls the timist;—"Stop," echoes the mate, suddenly arresting, in its run, the line which he had been so lavishly "paying astern." The nearest knot within or without the quarter is then examined. Six is the nearest at hand; and, though far wide of the ship's actual rate of going, yet six he imagines to be nearest the mark, and reports the same to the officer-of-the-watch.

"Six!—no *more?*" exclaims the Lieutenant. "Why, the last hour she was going *eight* and two." "Six to a *fathom*, sir," rejoins the mate, in a tone of confidence at once calculated to dispel his superior's doubt. "Possibly the wind is less than it was," returns the officer-of-the-watch, who, in all pro-

bability, is busily occupied building castles in the air, and not ther in the vein to question further the ship's *reported* rate of going. "Give her six," he says; and down "dives" this matchless mate to insert in the ship's official record her *erroneous* run. Now if the cause of the ship's diminution of speed be investigated, it will probably be found that, at the very moment the careless mate was paying the line astern, the ship was *shaking* in the *wind*, and had consequently lost much of her previous way.

Were gentlemen, instead of confining their interrogatories to the quarter-master holding the glass, to consider the necessity of putting questions of equal importance to the quarter-master standing *at* the *conn*, errors would not so often occur. As soon as one quarter-master has affirmed that his "glass is clear," the other, when sailing by the wind, should be thus interrogated:—"Quarter-master, *is the ship full-and-by?*" If going large, or steering by compass, "*Is the ship her course?*"—How seldom are these precautions taken!

MAST-HEAD, AND LOOK-OUT MEN.

THE mate-of-the-watch should order the mast-head-men aloft with the dawn of day. When relieved,

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and they descend on deck, they will report to the officer-of-the-watch whatever is in sight around.

This officer will be also required to visit periodically the night look-out men; see that they are all at their respective posts; that they are not napping; nor diverted from their duty by listening to tales in the waist,* nor to stories told on the forecastle.

CALLING AT NIGHT-LIEUTENANT'S RELIEF.

UNLESS employed in the execution of more pressing duty, the mate should invariably call and awake the officer of the succeeding watch. In discharging this service, young gentlemen are delicate, erroneously supposing that the act of shaking a superior's person may be deemed an impertinent liberty. Moreover, youths, when half sea-sick, and unsteady on their legs, are not to be entrusted with *lights*. They may leave them in positions to endanger the safety of the ship.

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* The author served in a seventy-four which nearly lost her bowsprit in consequence of the lee-cat-head man leaving his look-out to listen to a tale of laughter in the waist.

MAIN-DECK MATE.

GENERAL DIRECTIONS.

It is expected of this officer to superintend all duties which are to be executed upon this deck during the day, that is, from day-break until gun-fire, or, as it is sometimes termed, the "setting of the watch."

DISCIPLINE OF THE DECK.

The mate-of-the-main-deck will be held responsible for the cleanly condition, and general order and discipline of the deck. He should take every pre-

caution to prevent wrangling in the galley; nor should he permit noise to be made in the waist, nor, at any time, allow the boys of the ship, or officers' servants, to "sing out" upon the deck, or bellow down the hatchways below. Neither should he suffer the ship's company to wash their clothes between the guns, or to scrub any part of their apparel, except on those days appointed for the purpose.

CLEARANCE OF THE GUNS.— Attention is directed to the clearness of the guns; that the "ridge-ropes," fore-and-aft, be set up taut; and that neither the tools of artificers, nor "unfitted furniture," be placed within the proscribed line.

HALF-PORTS AND GRATINGS.—When the gratings and half-ports are unshipped, this officer should be careful that the carpenters cautiously secure them in their appointed places. The half-ports are frequently found defective, from inattention in fixing them firmly in their cleats.

CABLE GEER.

WHEN the cables are worked upon the main deck, he will be held responsible, by the master, that all

the nippers, stoppers, cable-ropes, hooks, &c., be kept in order, and in perfect readiness for use.

WASH-DECK BUCKETS.—The wash-deck buckets are placed under the care of this officer. They should be mustered every evening,* and to each department in the ship should be allotted a proportionate number. The buckets should be labelled and numbered — Forecastle, No. 1; Quarter-Deck, No. 2; Main-Deck, No. 3; and so on. The mate-of-the-main-deck should see that the cooper keep the buckets in proper repair.

SANDED BOXES, OR SPITTOONS, should be placed daily in the galley; and the cook cautioned to keep the vicinity of the coppers in a clean and wholesome condition.

SHIP'S COMPANY'S VICTUALS.

THIS officer is required to overlook the duties assigned to the cook. He should see that the salt-meat be properly steeped, and that the victuals of the crew be cleanly and palatably dressed. He should also, in conjunction with the assistant sur-

* When decks are washed, on the following morning. Generally speaking, there is too much washing afloat.

geon, inspect the coppers, see that they are kept in a clean and wholesome state, and that the skimmings of the boilers, in which salt meat has been boiled, be on no account given to the men, either to mix with their puddings, or to use in any other manner with their meals.—Nothing is more unhealthy, or more likely to produce scurvy.

BEEF — CUTTING UP. — The mate-of-the-main-deck should always be present at the "cutting up of the beef." Nor are "*choice* pieces" recommended to be taken from the "block." The service sanctions the custom; but the custom, for obvious reasons, were better abolished.

MIXING AND SERVING GROG.—The mate-of-the-main-deck should invariably attend to the mixing and serving of the grog, and see that the people's allowance be fully and fairly served. He should prohibit the practice (technically termed) of "bulling the cask;"—and, when a spirit cask is empty, see that it be thoroughly rinsed with salt-water, before it is struck below.

FIRST COMMISSIONING.

CLUES, LANIARDS, AND LASHINGS.

One set of clues, laniards, and lashings, for the use of the ship's company's hammocks, should be well blacked,* and traced up to dry between the tracing-posts, on the deck of the hulk. The superintendence of this duty is assigned to the mate-of-the-main-deck.

NIPPERS, STOPPERS—BIT AND RING.

The bit and ring-stoppers, together with the necessary number of nippers, should be fitted as

* This service cannot be taken too early in hand. Cold tar and salt water boiled together, and laid on hot, makes an admirable blacking.

early as possible. As the master becomes responsible for every thing pertaining to the cables, the mate-of-the-main-deck will consult with that officer as to the manner in which he may desire the stoppers to be fitted.*

FITTING MESSENGERS—POINTING HAWSERS.

Both messengers—the *spare* one, as well as that intended for immediate use—should be fitted as soon as supplied. The splices of the eyes should be pointed over, and a toggle, or *lashing*, attached to each messenger. The mate-of-the-main-deck will also be required to see that beckets be worked in the extremities of all towlines and hawsers allowed to the ship, and that the

* The *Bit-stopper* consists of four or five fathoms of rope, tailed out nipper-fashion at one end, and clench-knotted at the other. The stopper is rove through a hole in the knee of the bits, and brought close home to the knot. It nips the cable on the bight.

The *Ring-stopper* is made with a long piece of rope, unlaid at each end towards the centre, and fitted nipper-fashion, having enough *laid* up to clove-hitch into the ring-bolt; one end is placed on each side of the cable, one worked into the lay, and the other passed across over the first. These stoppers, in length, will depend upon the size of the cable. From three to four will be sufficient for any ship.

ends of all be properly pointed. The above cordage, as well as the stream-cable, should be stretched at the capstan before it is allowed to be coiled in the tiers.*

RIDGE-ROPES FOR GUNS AND WAIST HAMMOCKS.

THIS officer should also see fitted, blacked, and traced-up to dry, the ridge-ropes for the waist-hammocks and main-deck guns. These duties are too often given to the gunner.

FIRE-BUCKETS.

THE fitting of these buckets is assigned to the two-day-mates.—Vide *Gunner*.

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* This practice is seldom observed in the service, notwithstanding its obvious utility. All new cable-laid-ropes, hawsers, and towlines, as well as cables that require to run clear of kinks, should be either coiled against the sun till well stretched, or with the sun, and the *end* taken through the coil.—Vide *Master*—"*Coiling Cables.*"

IN PORT.

WORKING THE CABLES.

When the cables are worked upon the main-deck, this officer becomes accountable to the master that all the nippers, stoppers, cable-ropes, hooks, and requisite instruments for working the chain-geer, be kept in order, and in perfect readiness for use.

Working the Cables.—Upon every occasion when it may become necessary to veer cable, freshen hawse, or heave-in, the mate-of-the-main-deck will be required to attend in his station in the waist.

Chain-cables should be ranged in French fakes.

CLEARING DECKS BEFORE DARK.

THE practice of permitting this deck to be encumbered, in port, by planks, casks, cord-wood, sea store-rope, unbent sails, or unrove rigging, is not infrequently fraught with evil. Unless peculiar circumstances preclude the possibility of their stowage elsewhere, stores, and furniture of this nature, should never encumber the deck upon which the cables immediately work.

The mate-of-the-main-deck will be therefore required to report to the Commanding Officer, before night-fall, that the deck is as clear as circumstances will admit, and that ample room is left for the working of the capstan as well as of the cables. Neglect of this may lead even to fatal consequences.

HOISTING IN AND OUT BOATS.

WHEN heavy boats are to be "hoisted in" or "hoisted out," whatever be the "falls" or purchases worked in the waist, the main-deck mate should take especial precaution that the "leading blocks" be so placed as to permit the people, in

their progress aft, or forward, to "clap on" the falls led in opposite directions. By this system, considerable time will be saved, and the necessity spared of calling hands from forward aft, or from aft forward, to "re-man" the stay, or yard-tackle falls.

MOORING AND UNMOORING.*

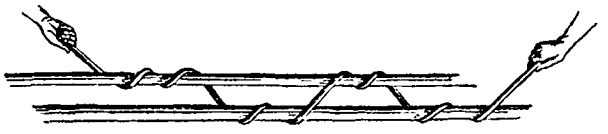
THE main-deck-mate will see that the foretopmen and gunners stationed to pass, shift, lash, and unlash, or toggle and untoggle † the messenger, perform their respective tasks with a silent and becoming speed; that when "heaving in," the boys and idlers light the messenger quietly and quickly around; that no *jambing* turns be taken with the nippers, and that the consequent cry of "avast heaving!" be discouraged, and the practice be resorted to as seldom as possible. If nippers be properly passed, and disengaged in time, there need be no necessity, particularly when working the chain-cable, to stop the rotatory motion of the cap-

* These directions are applicable to the main-deck mate of a frigate; in a line-of-battle-ship, to the lower-deck mate.

† Some ships bring the two eyes of the messenger together by means of a rope-toggle.

stern. When the anchor is hove up high enough for hooking the cat, and when the latter is hooked, and its fall hauled well taut, the mate-of-the-main-deck, previously to "surging the messenger," should be prepared to clap on a "cable-rope," for the purpose of running-out sufficient of cable to take the anchor to the cathead. A permanent *mark* for "catting" will save much of the customary noise incidental to the cry and pipe of "*cable* enough!" As soon as the mark for catting arrives in the hawse-hole, the cable must instantly be stoppered *over-all.*

Gower's simple and seamanlike method of clapping on a nipper that cannot jamb, is here subjoined.



"The nipper, thus applied, is taken once round the cable, and once round the messenger, the *foremost* end being wormed round the cable, and the *after* end round the messenger, and a hand is

employed to hold on each end of the nipper." By referring to the sketch it will be clearly seen, "that as each end of the nipper is drawn contrary ways by the cable and messenger, its turns can never come together, so as to jamb each other; at the same time *both* ends remain clear for taking off; while its binding effect, to hold the cable, remains indisputable."

WEIGHING WITH A HEAD SEA.

When weighing in a head sea, this officer is cautioned to have ready overhauled at hand a good deck-tackle. He should also take the precaution to pass the bit-stopper, and to trace up its bight, after the manner recommended in the chapter addressed to the Master.*

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* Vide "Practical Hints."

AT SEA.

THIS officer will be required to superintend *all* duties performed during the day in the waist. He is to observe the same instructions relative to clearing decks before dark, whether at sea or in port. The mate-of-the-main-deck should always be on the alert in squally weather, and be careful that the topsail-sheets be coiled clear for running, and that a gunner of the watch, or steady seaman be stationed to "stand by" the main-sheet, if worked in the waist. Attention is also directed to the lower-studding-sail tacks, and geer pertaining to the swinging-booms; and that all ropes under the care of the captain-of-the-mast be properly pointed.

LOWER-DECK MATE.

PRELIMINARY REMARKS.

THE duties of this officer are of more importance than might, at first sight, be imagined. The authority vested in him should be exercised with discretion and firmness, but not vexatiously. In his hands, strict discipline should be tempered with kindness. Instead of captiously finding fault with the men on frivolous pretences, he should manifest a regard for their personal comfort, and ensure their ready obedience more by forbearance than by calling for coercion. Should the latter, however, be absolutely necessary, of course he will not be slow in appealing to the Commanding-

Officer. But let him not be ingenious in discovering and magnifying causes for complaint. It is his particular province to be in constant intercourse with the men on the lower-deck; and were he even to study a little their respective dispositions, he may be enabled to discharge his duty with better effect,—to administer, as far as in him lies, to the general happiness of the ship's company, and therefore to promote a more firm and efficient discipline. It is hardly necessary to add, that perpetual objurgation, and foul and abusive language, render the obedience of inferiors unwilling, and almost ineffectual, because degradingly extorted; and it follows, as a necessary consequence, that when this is the case, *nothing goes right.*

GENERAL DIRECTIONS.

MESSES OF THE MEN.

In all matters connected with the change or choice of mess-mates, it is recommended to the mate-of-the-lower-deck to afford to applicants every possible accommodation, consistent with the custom of the service.* Although a man may not be disposed to divulge his motive, yet he may have reasonable cause for desiring to leave his mess; therefore it is, that considerations of mere "pen-

* It is customary to allow the people to change their messes monthly, giving timely intimation to the mate-of-the-lower-deck. Messes are formed of even numbers. Benefits are said to arise from permitting all the first class petty-officers to mess together. The author never served in a ship in which such a system was pursued, but there appears no objection to its general adoption.

and-ink" trouble to the purser's steward are not to be put in competition with the personal comfort, or mental happiness, which the change may afford to the seaman or marine.

The mate-of-the-lower-deck will be required to keep a mess-book* for the guidance of the first lieutenant.

HANDS TURNED-UP.

WHENEVER the hands are turned-up to execute any specific service, he will hasten the movements of the men, stimulate exertion, and report to the Commanding Officer when "all are up from below."

PIPING-UP, AND DOWN, HAMMOCKS.

IN piping up, he should never permit the men to let their hammocks touch the deck; nor, in "piping down," should he tolerate the injurious practice of heaving them heedlessly down the hatchways. When the hammocks are all hung up, the-mate-of-the-lower-deck should make his report to the senior lieutenant. In cases of dispute between men touching encroachments of hammock-berths, he

* In estimating individual character and conduct, this book will be found of the first utility.

should not impatiently dismiss the parties without redress, but personally investigate the matter, and do his best to satisfy complainants.

PREPARATIONS FOR DINNER.

PREVIOUSLY to piping to dinner, he should inspect the mess-kids of the men, see that they be all in a proper and cleanly state, and ranged in order fore-and-aft upon the tables of their respective berths. At seven *bells*, he should direct the lower-deck to be swept, and see that three tubs,* for the purpose of collecting potato-peelings and bones, be placed at equal distances on the deck; that those seamen and marines destined to "relieve their men" at noon—such as boat-keepers, helmsman, leadsman, look-out-men, and the several sentries planted on post—have their dinners served-out, and that they be not disturbed at their meal.

AIRING AND VENTILATING THE LOWER-DECK.

HE should use every endeavour to prevent humidity below; and report to the senior lieutenant, upon

* In small ships one tub will suffice. The mess-cooks of the preceding day should be appointed to place and empty the tubs before and after dinner.

all occasions, when lighting of stoves becomes requisite. He should also direct his attention to the wind-sails, and employ every possible means to promote a free circulation of air fore-and-aft.

DRY HOLY-STONING THE ORLOP.

SHOULD it be the custom of the ship to holy-stone the orlop-deck, it is recommended to this officer to direct the wing-gratings to be unshipped, and stoned in the nearest cockpit. By this precaution much of dust and dirt will be prevented lodging on the tanks, or accumulating in the hold underneath.

WET CLOTHING BELOW.

HE should never permit wet clothing to remain below. If the weather be fine, he should report the circumstance to the first-lieutenant, in order that damp garments may be piped-up and dried upon lines rove for the purpose. If the weather be wet, the clothing of the people should be put in tubs, and kept under the charge of the sentinel at the door of the ward-room or the cabin.

FIRST COMMISSIONING.

BERTHING HAMMOCKS.

One of the first duties which will devolve upon this officer, will be that of berthing the ship's company's hammocks.* To attain that precision

* The author bears in recollection an instance of a Lower-deck mate, who had imagined himself particularly expert and expeditious in the completion of his task, having made a sad blunder in "berthing" the ship's company's hammocks. The mate appearing on the quarter-deck, reported officially to the senior lieutenant the circumstance of his having "completed," as he termed it, "his troublesome task." "Sharp work!" returned his superior. "Come, I'll accompany you below to inspect your labours." The lieutenant repaired on the lower-deck, when, looking overhead, he discovered all the black numbers on *one* side, and all the red on the other. "Holloa! how is this?—Red, starboard side; black, larboard!" "All right, I believe, sir. You'll find each watch berthed on its *own* respective side." "Then, sir," returned the lieutenant, "I shall find that the mate-of-the-lower-deck has made a most egre-

so essential in the execution of this service, and to prevent those perpetual disputes which so often arise in consequence of faulty admeasurement, it will be found expedient to reduce every clew and hammock fore-and-aft to an equal length. New hammocks, when issued from the dock-yard store, generally run from five-feet six to five-feet four; but when properly squared, tabled, and reduced to the dimensions best suited for "berthing," they should be made to measure five-feet two.

To berth for the war-establishment the lower-deck mate will thus proceed:—

Commence forward, beginning with No. 1, and allow fourteen inches in width to each "single berth," and twenty-eight to each "double,"* and from batten to batten,† or grummet to grummet,

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gious blunder. So when the ship's at sea, the *weight* of the watch below is to be all on *one* side." "I never thought of that, sir." "So it seems." The brush of the painter was immediately put into requisition to remedy the blunder.

* For petty-officers. The hammocks of the boatswain's-mates to be berthed nearest the hatchways.

† Battens are getting out of fashion: screwed hooks are now substituted instead. But hooks, though neat and sightly to the officer, are not looked on by the foremast-man with a favourable eye. The fact is, the men complain that they have no means afforded them of *getting-in* and out of their hammocks.

eight-feet eight to each length of "longer." The locking-in will depend upon the carlins; but from eighteen inches to two feet will be found sufficient for any description of vessel. In measuring the "longer," it were desirable not to trust too implicitly to spun-yarn, lath, batten, or rod. Two hammocks cut the desired dimensions, and slung by clews of the established length, will at once shew the "locking-in," and will always act as a check on admeasurement derived by other means.

The berther is recommended not to paint the figures overhead until he fully ascertains the exact number of berths fore-and-aft. The numbers may be marked in chalk, employing over each an 0 for the starboard watch, and a × for the larboard. When all is right, and it is manifest that there is "no mistake," the painter may then "figure away" in any colour or colours the senior lieutenant may select.

TABLING AND NUMBERING HAMMOCKS.

THE mate-of-the-lower-deck should apply as early as possible to the senior lieutenant for the services

of a sail-maker and painter to table and number the ship's company's hammocks. He should also remind his superior of the necessity of having the *bags* "drawn" from the dock-yard among the first stores that may be issued to the ship. The bags should be numbered as soon as received, and put apart, till the paint be dry, before served out.

FITTING PORT-TACKLE-FALLS.

As, in all probability, the gunner will be in daily attendance at the gun-wharf, it will be incumbent on the mate-of-the-lower-deck to superintend the fitting of the port-tackle-falls. He should, therefore, apply to the senior lieutenant for one of the gunner's mates, and two or three of the gunner's crew, to execute this service, and to perform no other till each port-tackle fore-and-aft be finally fitted.

REPORT DAILY WORK IN PROGRESS.

WHATEVER work, or divisional duty, he may have in hand, the mate-of-the-lower-deck should make it an invariable rule to report progress every evening to the senior lieutenant. He should also

consult his superior upon the duty he will be required to perform on the following day.

SPARE LOWER CAP.

THE mate-of-the-lower-deck is particularly cautioned not to stow, or finally secure the spare lower cap below, until he has previously ascertained from the carpenter or commanding officer whether this article of "*fitted* furniture"* has been *tried* and found to *fit*.

SPARE SAILS.

As soon as each spare sail be fitted, properly "pointed," and ready for making-up for stowage in the sail-room, the mate-of-the-lower-deck should thus proceed:—

MAKING-UP A COURSE.—Sweep well the sail, and clear it of all shakings, dust, and dirt; stretch then the head taut along the deck; bring up to the *head* the belly-band, then the foot, leaving the clew-blocks out at each end, also the bowline-bridles, and roll taut up. Pass the head-earings round the sail close inside the bolt-rope, and put a

* Vide CARPENTER, on "Fitted Furniture."

stop of good spun-yarn to every seam. The reef-earings are made up in the sail. Attach a label* to each end of the sail when made up. The centre robin should be longer than the rest, to mark the middle of the sail.

MAKING-UP A TOPSAIL.—Stretch the head of the sail taut along the deck; bring the second-reef up to the head; dispose of the points snugly along in lines parallel to the seams of the sail; then bring-up the belly-band, then the foot, leaving the clew-blocks,† bowline-bridles, and reef-tackle, toggles each, and all separately *out*. Roll well up; stop well with spun-yarn at each seam. The head-earings expend round the ends of the sail. The reef-earings should be separately cleared, and hitched with two half-hitches to the reef-earing cringle *above;* and the centre eyelid hole, in the

* The mate-of-the-lower-deck must be prepared with labels properly painted on slips of canvas.

† With topsail sheet-blocks various modes have been tried. Some ships shorten the clews, and toggle the sheet-block into the clew. This plan answers well in small ships, but is not to be recommended in ships larger than that of the small class frigate. Though, as yet, little in vogue, no method will be found to answer better than the dog-bitch-thimble. This plan will always prevent the half-turn so often seen in the clew of the sail.

head of the sail, should have a long roband, or piece of line, for the purpose of *middling* the sail to the topsail tie-block on the yard. The topsails should be always stowed with a salvagee sling round the sail. The bight of the slings should *not* be passed through the opposite bight, but be stopped with spun-yard, so as to disengage the slings from the sail the moment the stop is cut. The long-tackles for sending the topsails aloft, should be coiled up at the length requisite for reaching from the orlop to the topmast-head, and ultimately stowed in the sail-room on the *top* of the topsail.

Top-Gallant-sails and Royals.—As top-gallant-sails and royals are always bent to the yards when on deck, there need be no necessity to make them up with their clews and bowline-bridles left-out. The smaller the compass in which each is made up, the better for stowage below.

Fore-and-aft Sails are always made up in the two after cloths.

Jib.—Stretch the luff of the sail taut along the deck, double the head in, then the clew, making the sail as near the same breadth at the head and foot as possible; then roll up, and stop taut at

every three feet. Spankers, stay-sails, trysails, &c. are all made up after the same manner.

STUDDING-SAILS. — The lower studding-sail, being nearly square, can be rolled up in either the inner or outer leach. Expend the earings round the head, and stop at every two feet.

TOPMAST STUDDING-SAIL.—Lay the sail along the deck, overhaul the downhaul through the thimble and block, and bight it along the whole length of the leach; then roll up towards the inner leach; lay the sheets along the whole length of the sail, roll up over all, and stop the sail well up with spun-yarn. Expend the earings round the head.

Top-gallant studding-sails are also made up in the inner cloths.

HINT.—The distinguishing labels which are to be attached to the spare suit of sails, should be affixed to *each* extremity of each sail before it is placed in the sail-room. The sail-maker, together with the mate-of-the-lower-deck, will be required to take an inventory of the unbent suit, noting particularly the disposition of the stowage.

The following Table shews the dimensions of the courses and topsails of line-of-battle ships, frigates, and sloops:—

Ship's Rate. No. of Guns.	Sails.	Head.		Foot.		Depth or Hoist.	
		Ft.	In.	Ft.	In.	Ft.	In.
Ship 110 Guns.	*Fore-Course*	81	0	78	0	40	0
	Ditto Topsail ...	51	6	82	0	53	6
	Main-Course ...	93	10	97	0	45	6
	Ditto Topsail ...	60	9	96	0	60	9
Ship 80 Guns.	*Fore-Course*	80	0	77	0	45	0
	Ditto Topsail ...	51	2	82	0	54	3
	Main-Course	92	9	96	7	52	0
	Ditto Topsail ...	60	9	94	10	60	6
Ship 74 Guns.	*Fore-Course*	75	0	71	0	42	9
	Ditto Topsail ...	50	3	77	6	50	6
	Main-Course	86	0	90	6	48	9
	Ditto Topsail ...	57	6	87	6	57	3
Ship 52 Guns.	*Fore-Course*	75	0	71	0	41	0
	Ditto Topsail ...	50	3	77	0	50	6
	Main-Course	86	0	90	0	45	0
	Ditto Topsail ...	57	6	87	6	57	3
Ship 28 Guns.	*Fore-Course*	49	0	47	6	31	0
	Ditto Topsail ...	32	6	50	0	33	6
	Main-Course	55	8	60	0	34	0
	Ditto Topsail ...	36	6	56	9	36	0
Corvette 18 Guns.	*Fore-Course*	49	0	47	6	31	0
	Ditto Topsail ...	32	6	50	0	33	6
	Main-Course	55	8	60	0	36	0
	Ditto Topsail ...	36	6	56	9	36	0

A difference in the above dimensions must necessarily ensue if the contemplated scale of masts and yards be adopted in the service. *Straight* leeches will improve much the general appearance of the topsails.

SHIFTING FROM THE HULK.

THE noise, confusion, dispute, and personal danger consequent upon this proceeding, may be entirely avoided by permitting two men from each berth to remove gradually their mess utensils. A couple of days prior to the final "shift" would suffice to satisfy every purpose.

IN PORT.

LOWER-DECK PORTS.

THE lower-deck mate should never permit the ports to be hauled-up or lowered at pleasure. In well-regulated ships a roll of the drum indicates the precise time when such movements are to be simultaneously made.

CELLS OF THE PORT CLEAR.—The clear appearance of the port-cells will always indicate the orderly condition of the lower-deck.* Handkerchiefs and other articles of the people's apparel should never be seen suspended in the vicinity of the cells of the port.

* Some ships have racks fitted for the stowage of the men's hats—a desideratum with seamen.—Vide FIRST LIEUTENANT.

RECEIVING COALS.

UPON every occasion of receiving coals on board, the mate-of-the-lower-deck should take the precaution that tarpaulings be properly placed in the port-cells and combings of the hatchways, previously to shovelling the coals in upon deck.

MANGER CLEAR—CABLES READY FOR WORKING.

HE should never permit the manger to be lumbered, and should observe the same injunctions relative to working the cables which have been already given to the mate-of-the-main-deck.

HAMMOCKS OF LIBERTY MEN.

IT is the duty of this officer to see that the hammocks of such men as may be absent from the ship on leave, be either stowed in the sail-room, or "taken up and down," by people* appointed for the purpose.

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* Vide FIRST LIEUTENANT—Principle of "Partners."

AT SEA.

COMPARED with the duties which devolve upon this officer in port, his labours when at sea will be comparatively light. He will, however, be required to pay the strictest attention to the dry, airy, and cleanly condition of the deck.

LOWER-DECK PORTS, WHEN UP.

WHENEVER the lower-deck ports are "hauled-up," it will become an indispensable duty, on the part of the lower-deck mate, to keep a watchful eye upon the weather; bearing in recollection, that should the ship be taken in a sudden *squall*, the officer in charge of the watch may be too busily employed in shortening sail upon deck to divide his

attention between the ports *below* and the sails aloft. The mate-of-the-lower-deck will be also required to superintend, every evening, the carpenter's crew barring-in the lower-deck ports.

CLEARNESS AND SECURITY OF THE LOWER-DECK GUNS.

It being of the first importance that the lower-deck guns, when at sea, be kept perfectly free from lumber, and that they be thoroughly secured in every particular, the mate of this deck is strictly enjoined to give to the gunner every possible assistance in attaining these ends.

DRAWING-OFF SPIRITS—NAKED LIGHTS.

The mate-of-the-lower-deck must never allow inflammable liquors to be "drawn-off" below. Spirits should be always hoisted upon deck, and drawn-off during the day. When the spirit-room is open, the lower-deck-mate should take the precaution that the master-at-arms, or ship's corporal, be at his post to prevent the use of "naked lights" in the cockpit or hold. When the spirit-

room is closed and secured, the key should be immediately returned to the master. On no occasion is he to allow lights to be used in the orlop, or cable tiers, except in good lanthorns; nor candles to be *stuck* against the beams or sides of the holds, or other parts of the ship.

Note—Those duties which immediately relate to the holds, tiers, and orlop-deck, are to be considered, in ships which "bear" a Second-master, as assigned to that officer.

CAPTAIN'S CLERK.

PRELIMINARY REMARKS.

As new arrangements are in contemplation, touching the revision of "ship's books," it is sufficient here simply to say, that the clerk should be well versed in the principle of "book-keeping," and in the most efficient manner of *checking* accounts; nor should he be unacquainted with the rudiments of literary composition; as, without this knowledge, the despatches he may be required to write, on hasty dictation, will be deficient in the required perspicuity. As his situation is, in many respects, a confidential one, he should be circumspect in his conduct, and take for his motto the three words —TRUST-WORTHINESS, SECRECY, and TRUTH.

GENERAL DIRECTIONS.

CLASSIFICATION OF OFFICIAL PAPERS.

WITH a view to ensure an orderly and systematic arrangement of public papers, and a ready reference to official records, the clerk should classify, according to their tenor and date, every description of receipt, voucher, and public document in the captain's possession, attaching to the exterior of each packet* a distinct label, denoting its particular contents.

SHIP'S BOOKS.

MUSTER BOOK.—It is to be hoped that the misnomer in the title of this book will soon be

* Confined by two small boards, one at the top, and the other at the bottom, secured by a small piece of light line.

removed; for, surely a book that embraces the various particulars required to be recorded in its several columns, ought to possess some other appellative than "*Muster-book*," as such would seem to indicate a mere list of *names*. The formula of this book is at present undergoing revision. Be the title retained or not, the book, it is said, will be a half-yearly register of "Muster," "Pay," "Victualling and Slops."

THREE-MONTHLY BOOK.—If the proposed system of paying the ship's company, by the purser, every six months, be adopted, it is probable that this book will be abolished. At all events, until new instructions be issued, the clerk should recollect, that from the "muster-book," or "complete book," is to be made out a quarterly muster-book, which is to be transmitted to the Admiralty-Office regularly on the 31st of March, 30th of June, 30th of September, and 31st December in each year; and the following instructions respecting it are to be most carefully attended to:—

"The day and date of the month upon which a muster is made, is to be entered at the top of the column, to denote the muster, while the following

marks against the men's names are to shew absence:—

√	Checked on leave, or lent.	
×	-	- without leave.
S	-	- sick at the hospital."

SLOP-BOOK—ISSUE OF SLOPS.—Although it is in contemplation to abolish this book, and to substitute, in the general "half-yearly account book," columns to contain statements of slops supplied; yet, for *rough* work, and particularly for reference, it will be necessary to keep a separate book.

When slops and tobacco are served to the ship's company, the clerk will be required to attend and to enter their issue.

ALLOTMENT BOOK.

No future alteration either in the registry of the ship's accounts, or of the people's pay, can supersede the necessity of keeping this book as a work of reference. Nor should the necessary cautions touching allotment "declarations" be neglected by the clerk.*

* "No man is to be permitted, on the first fitting-out of the ship, to sign a "*Declaration*" of allotment of part of his wages until the

REGISTRY OF OFFICERS' BILLS.

THE clerk should keep a separate book for the officers' bills; and he should never present for the Captain's approval a "quarterly bill," until the signature of the drawer be affixed.

LETTER BOOK.

THE clerk will be required to keep for the captain a public LETTER BOOK, in which he will enter a true copy of every official communication his Commander may make. He should note in the margin, with *red ink*, the day and date, and by what conveyance each letter has been despatched. For example: By this day's post—Portsmouth, Jan.

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ship is nearly ready for sea, or until he has belonged to her *three* months. The commencement of every allotment to be regulated by the amount of charges already incurred; that is to say, if a man has received slops, or other allowances, to a certain amount, and is to be paid two months' *advance*, his allotment should be regulated so as to prevent his being in debt at the expiration of the first six months. Men desirous of allotting to a wife or child, are to be strictly questioned as to their having been married; and the place *where*, and the time *when*, married; and the Christian name of the child, and when and where baptized, are to be stated in the declaration; in which also the names of the men are to be inserted in numerical order, with their number on the ship's books." —*Naval Instructions.*

1st, 1835—Per *Pike*—Lieutenant Roach—at Sea —Feb. 1st, 1835.—Lat. in 49° 20′ North; Long. in 14° 10′ West.

LOG BOOKS.

INDEPENDENTLY of those periodical logs, which, on the termination of a cruize, the captain is required to present to the Admiral, or Senior Officer, under whose orders he may immediately serve, the clerk will have to keep two copies of the Ship's Log, one to be transmitted half-yearly to the Admiralty, and the other for the purpose of passing the captain's annual accounts.

PROMPT REPLY TO OFFICIAL LETTERS.

FROM the multiplicity of matters occupying the captain's attention, it sometimes escapes his recollection to reply to official letters. To prevent this, it will be incumbent on the clerk to remind the captain whenever a public communication requires a prompt reply.

WEEKLY ACCOUNTS.

THE clerk should be particularly careful that all returns inserted in the columns of the "Weekly

Account" be correct in every respect. He should procure from the master, surgeon, and purser, their several "Returns."

SIGNING OFFICERS.

THE signing officers of all "Muster Books" are to be the captain, the commander, or (where there is no commander) the senior lieutenant, the master, and the purser; but where any document to be signed relates to the receipts, expenditure, or disposal of stores, in charge of any officer, that officer is to sign it instead of the purser.

SICK-TICKETS.

WHEN a seaman or marine be sent to an hospital, or sick-quarters, for cure, a *sick*-ticket, signed by the signing officers and surgeon, is to be sent with him, in which his original entry, number, and rating on the "Muster Book," a description of his person, his age, &c., and all charges which appear against him on the ship's books, are to be inserted; and, on the back of the ticket, the surgeon is to specify the nature of his disease or hurt. An inventory of the man's clothes should accompany the

ticket, and on the latter should be noted whether the patient has or has not been victualled on board, the day of his removal. Should the patient be sent on shore for the cure of wounds received on duty, or in action, the clerk will insert on the ticket the following words:—"Sent to sick-quarters for wounds received on duty," or "in action with the enemy," as the case may be.*

DISCHARGED-MEN CERTIFICATE.

SHOULD the annexed form of certificate be adopted, the clerk must be cautious that all particulars be inserted correctly, in the proper columns, before he procures the signature of the Captain.

* "Naval Instructions."

The Form of Certificate, to be ruled on parchment, which is to double up in the middle.

The outer side as follows.

Name.	Date of Entry in the Service.	His first Ship, and No. in her.
John Thomas.	*3rd June*, 1820.	*Britannia*, 350.

Ships' Names.	No.	Rating.	Entry.	Discharge.	Y.	M.	D.	Conduct.	Captain's Signature.
Britannia	350	L. M.	3d June, 1820	10th Sept. 1823				Good.	G. Davis.
Caledonia	680	Ord.	11th Sept. 1823	1st Nov. 1826				Good.	C. Brown.
Endymion	270	A. B.	2d Nov. 1826	30th Sept. 1829				Very good.	T. Jones.
Madagascar	140	A. B.	1st Oct. 1829	4th June, 1832				Very good.	H. Mason.

FORM OF INSIDE.

Description of the person &c. of JOHN THOMAS.

On his first Entry in the Service.	On his Discharge at the Age of 30 to 35.	After the Age of 35.
Where born { Parish— Town—*Falmouth* County—*Cornwall.*		
Usual Place of Residence—		
Age—20 *years and* 10 *months.*		
Stature—5 *feet and* 8 *inches.*		
Complexion—*Ruddy.*		
Eyes—*Light blue.*		
Hair—*Light brown.*		
Marks on person—*An anchor and four stars on right arm.*		
Wounds or scars—*Scar on the left cheek.*		
If Invalided: When	For what Complaint.	From what Station.
Do.		

SURVEY REPORTS.

"THE reports made by Surveying Officers are to specify by whose orders the surveys were taken, and for what purpose; what were the articles ordered to be surveyed; the quantity and quality of those articles remaining on board, or the actual state of any which shall be particularly represented as deficient or defective. The number or quantity is always to be written in words at length. Should stores complained of be found no longer fit for their proper use, the reports are to specify whether they be fit for any other, and for what—or whether they be no longer fit for any other purpose whatever.

"There are to be two copies of all reports of surveys, each copy signed by all the surveying officers, and approved by the captain; one of which, written on the back of, or attached to, the order for the survey, is to be delivered to the officer in charge of the article surveyed; and the other to the captain, for him to transmit, if the survey was held by his order, to the officer by whose authority it may have been held: but when

the articles surveyed are to be transferred to the charge of another officer, *a third* copy, signed and approved in the same manner, is to be delivered to such officer, who is, if possible, always to be present during the survey."*

PILOTAGE CERTIFICATE.

THE certificate, which the pilot is required to produce for the purpose of procuring his pay, "may, if necessary, be given in duplicate, or triplicate; but, in order to prevent more than one payment thereon," the clerk is cautioned, "that all be addressed to the same person and place, and that each be severally distinguished by the word *original*, duplicate, or triplicate."

REPORT OF SHIP'S QUALITIES.

THE clerk is reminded that one of these reports is to be transmitted to the Admiralty on the 1st of January in every year, and that another is to be left with the captain's successor, or delivered to the superintendant of the dock-yard on paying off.

* "Naval Instructions."

SHIPMENT OF FREIGHT.

THIS officer will be required to take careful account of all specie, jewels, or valuable freightage deposited on board for security or carriage, and ascertain particularly that the several bags and boxes "*said* to contain" gold, silver, and jewels, accord in their external description with those mentioned in the bills of lading.

The clerk should also remind the captain that a return of treasure shipped, and of freight paid, or to be paid thereon according to the prescribed form, is to be transmitted to the Commander-in-Chief, or to the Secretary of the Admiralty. His attention is also directed to sending a duplicate of the said return to the Commissioners of Greenwich Hospital, under cover to the clerk of the check of that establishment.

A half-yearly general return of all freightage is to be transmitted to the Commander-in-Chief or the Secretary of the Admiralty, on the 1st of January and the 1st of July in each year. The clerk is recommended to peruse the "provisions" respecting the freight proclamations.

CAPTAIN SUPERSEDED.

WHEN a captain is removed from the command of a ship, the clerk should present a list of every official paper which is required to be turned over to the custody of the succeeding commander. He should also procure for the captain retiring, a specific receipt for every thing "left in charge."

SHIPWRECK.

SHOULD the ship be wrecked, the clerk should employ every endeavour to save those books which relate to the ship's company's pay. He should also consult with the captain, whether the signal books *should be destroyed or not.*

FIRST COMMISSIONING.

To insure accuracy in the public accounts, it is essential that this officer should join the ship upon the "*hoisting of the pendant.*"

DEMANDS.

For Stationery.—Upon entering on office, the clerk should immediately "make out a demand" for stationery. When the signature of the captain, or that of the commanding officer, be affixed to this document, the clerk will deliver it at the office of the superintendant; where, upon "approval," will be issued the necessary supply.*

* It is to be hoped that the proffered suggestion to simplify the supply of paper will soon be adopted. It is this:—The paper

For Survey Books.*—Early application should be made for these books. Those pertaining to the boatswain and carpenter are to be procured at the dock-yard; those for the guidance of the gunner, at the office of Ordnance Storekeeper.

For Marines.—The clerk will procure the captain or commanding officer's signature to this application, which is to be addressed to the Commandant of the —— division of Royal Marines.

Note—Upon the embarkation of the "party," the clerk will be required to enter a personal description of each man in the Captain's "Description Book."

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required for the period the ship is likely to be kept in commission is to be packed in a portable box, suited to the rate and size of the ship; the contents to be labelled on the *inner* part of the cover, and on the *outer* to be painted something to the following effect—"Stationary for First-rate. Three years' supply;" and so on, according to the rate of the vessel. Should the ship be short of three years in commission, the "unused stock" can be always returned into store.

According to the present system, the clerk is compelled to specify in the "demand" a minute statement of what is required; and for this the clerk has no guidance, the captain not being furnished with an official schedule.

* These books are also *misnamed.* They are in fact but inventories of those stores which the warrant-officers are required to demand for the ship's equipment.

DESCRIPTION BOOK.

THE clerk should register, as early as possible, the age, place of nativity, and personal description of each boy, seaman, and marine borne on the books. He will also be required to make a daily return to the captain of newly-raised men.

ARTICLES OF WAR.

THE articles of war, and abstracts of Acts of Parliament for the encouragement of seamen, should be placed in some conspicuous part of the ship. Boards for this purpose will be supplied to the clerk on application to the carpenter.

PORT ORDERS—GENERAL ORDER BOOK.

THE duty of copying the "orders of the port" devolve upon the clerk; and in this service he is cautioned not to indulge in delay. For the purpose of officers copying incidental orders, he will prepare a book, to be designated "*General* Order Book." The book should be "fitted" with a canvas cover, loop, button, and becket, and labelled as above on the back.

DAILY PROGRESS.

ALL particulars required to be inserted in the columns of this daily return, the clerk will derive from the senior lieutenant. Save when "sick," or when on "Admiralty leave," the signature of the captain is always to be affixed to this document.

ASSISTANT SURGEON.

PRELIMINARY REMARKS.

No officer serving in a vessel-of-war has it more in his power to promote content afloat than the assistant-surgeon. When men are suffering from bodily affliction, and meet with kind and consolatory treatment, they soon discover the advantages and benefits derived from serving in a king's ship. The two objects which should be the chief study of the assistant-surgeon are, the administration of every thing that can insure the comfort and promote the recovery of the sick, and the acquirement of professional science. In addition to the chapter addressed to his superior, the assistant may benefit by the few following hints, under their respective heads.

GENERAL DIRECTIONS,

ATTENTION TO THE SICK.

THE time and attention of the assistant-surgeon cannot be too constantly devoted to his patients, and particularly to the administration of comforts to those *confined* to the sick berth.

SICK BERTH.

THIS officer is held responsible for the order and *cleanly* condition of the sick berth. The care and custody of the medicines, and disposition of the Dispensary, are duties especially assigned to him; and he is particularly enjoined to enforce the strictest prohibition of naked lights in

the sick berth. Nor should lint, loose tow, nor any inflammable ingredient, be placed in positions liable to ignite.

ADMINISTERING MEDICINES.

MEN-OF-WAR'S-MEN, like most other people, have little predilection for physic; and, when under medical care, the young sailor often enacts the "old soldier." The assistant-surgeon is therefore recommended to take the hint, and particularly to see that patients pitch not pills out of the port, nor consign draughts to the bosom of the deep.

SHIP NEVER TO BE LEFT WITHOUT SURGICAL AID.

ON no account is the assistant-surgeon to absent himself from the ship, or even procure permission from the commanding officer to leave the vessel, under any pretence, without previously obtaining the sanction of the surgeon. And if the latter happen to be on shore, or out of the ship, the assistant should prepare himself for the treatment of every casualty. If an accident be of that nature to call for superior advice, he should not

hesitate to request of the commanding officer to send for the surgeon of the nearest ship.

SICK LIST.

After the surgeon and assistants have severally performed their morning duties, the senior assistant is required to return to the first lieutenant a list of the sick, a copy of which he is also to lodge in the binnacle drawer on deck, as a guide for the officer-of-the-watch.

Convalescents should be particularly specified; but the practice of pointing out patients, for the purpose of recommending them to execute *light* labour, should not be too sedulously pursued. Some patients, it is true, require occupation to dissipate gloomy thoughts; but, after all, picking oakum can only come under the denomination of fiddling of the fingers, and "teazing" the yarn tends more to teaze than to amuse the mind.

AIRING BEDDING OF THE SICK.

The assistant-surgeon should represent to the senior lieutenant when it is necessary that the bedding of the sick should be aired upon deck; and beds and

blankets should never be placed in the boats or on the booms, unless permission be previously obtained from the commanding officer, when in port, or the officer-of-the-watch when at sea.

COOK'S COPPERS—CLEANLY CONDITION.

It is particularly the province and duty of this officer to examine daily into the state and condition of the cook's coppers, and to report to the senior lieutenant the result of such inspection. This duty is too often neglected; and, as negligence begets neglect, the cook becomes more careless of his coppers than his *coin*, and calculates less upon the poison of the verdigrease than the *profits* of "slush."

List of Instruments with which the Assistant-Surgeon is to furnish himself.

Two amputating knives—one ditto saw—metacarpal saw, with two blades—catlin—artery forceps—twelve curved needles—two tenaculums—two tourniquets—bone-nippers—two trephines—head-saw—raspitory—forceps—brush—elevator—two trocars—two silver catheters—elastic gum

catheter—six scalpels—key tooth instruments—three spare claws, different sizes—gum lancet—tooth forceps, curved—ditto, straight—punch—seton-needle in scales—long probe—bullet forceps—probang—set of pocket instruments—twelve lancets—six pewter syringes—Fahrenheit's thermometer.

CARPENTER.

PRELIMINARY REMARKS.

THE qualifications required to support this station are neither few nor easy of attainment. In the theory and practice of caulking, boat-building, mast-making, and in the general principles of naval architecture, the carpenter must not be deficient; nor should he be unacquainted with the relative power, property, and specific gravity of different timber. He should also be familiar with the most approved methods of appropriating spare spars for temporary purposes; and, upon all occasions of emergency, be competent to make the most, upon mechanical principles, of *scanty* ma-

terial. He may also be called upon to return "reports," or offer official opinions, touching the "qualities"* and general "behaviour" of his Majesty's ships and vessels at sea—a requisite highly essential in the discharge of his calling.

The supposition that the carpenter's station is comparatively unimportant, may be considered in the light of one of those popular fallacies which have so long prevailed afloat. In the hour of danger, when the perils of the deep discourage, and even dismay the stoutest heart, the ingenuity and resources of the skilful carpenter may be the sole and immediate means of affording consolation, reviving the drooping spirits of a cheerless crew, and ultimately of restoring a happy confidence in all.

Like every officer afloat, the carpenter is cautioned never to employ that worthless word "*impossible.*" It offends the official ear, and conveys no very favourable impression of the utterer's willingness to work. He should consider it as expunged from the naval vocabulary; and, in lieu thereof, adopt the more cheerful phrase, "*we'll try.*"

* Vide article of "Ship's stability."

GENERAL DIRECTIONS.

CARPENTER'S CREW.

THE carpenter should use every endeavour to procure an efficient crew;* and return to the commanding officer an official report touching the capabilities of each artificer.

He should avoid familiarities with the people of his crew; and, upon all occasions, endeavour to control them with temper and becoming firmness. He will be required to superintend the carpenters when at work; and to warn his crew, collectively and individually, that no plank, spars, nor timber

* During hours of recreation on shore, zealous carpenters have before now raised volunteers sufficient to complete their respective crews.

be cut up, or appropriated to any purpose, till his previous sanction be obtained.

STORES AND STORE-ROOM.

THE carpenter will be held responsible for the order and ready disposition of his stores; and he cannot too often caution his "yeoman" of the dangerous practice of carrying or placing "naked lights" below in his store-room. He should return the key every evening to the senior lieutenant. He is required to submit, for the captain's approval, his "Expense-book"* twice in the week.

DAILY RETURN OF DUTY PERFORMED.

THIS officer, every evening, should present to the senior lieutenant a return, in writing, of the duty performed during the twenty-four hours; and, upon the same occasion, submit to his superior a proposition of work for the ensuing day.

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* The expenditure of stores, whether of those for present use, in lieu, or for sea-store, must be inserted daily in the Rough Expense-book; in which the exact date, for what use, and the names of the stores, and the quantity, in words written in length, must be specified in the proper columns thereof."—*Naval Instructions.*

GRATINGS AND HALF-PORTS.

THE carpenter should keep the gratings in constant repair, and see that they are properly numbered for their respective hatchways; and, when unshipped, that they be each and all securely placed. He is never to permit the half-ports to be seen astray upon the decks.

TARPAULINGS OF THE HATCHWAYS.

HE should attend, morning and evening, to the placing and re-placing of the tarpaulings pertaining to the different hatchways. If they be painted, he is recommended to roll them up on rollers, instead of making them up on the flat.

TURNING THE COCK.

UPON all occasions of washing decks, the carpenter should be cautious that a careful and steady hand be placed in the wing to attend to the "turning" and stopping of the cock.*

* Five feet of water was very unexpectedly discovered in the hold of the G——— frigate, in consequence of the carpenter stationed to attend the cock in the wing having fallen fast asleep. The crew had been employed in the tedious occupation of washing

PUMPS, AND PUMP-WELL

THE perfect efficiency of the pumps should be the carpenter's constant care. He should therefore frequently inspect their fixed and moveable geer, but particularly that pertaining to the chain apparatus. He will be held responsible for the healthy and wholesome condition of the well.

PORT-LINING AND SCUTTLES.

IN a ship-of-the-line, the carpenter should constantly examine the "linings" of the lower-deck ports, and see that they be kept in proper repair. The same precaution should be observed in the scuttles of the frigate.

HINT.—Before cutting, for lining ports and scuttles, the "*fear-nought*" should be well wetted and dried.

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clothes, and scrubbing "hammocks and bags." The gauntlets and lines had been all filled and traced-up, fore-and-aft, when the mate-of-the-watch, abruptly opening the gun-room door, [for it was late in the afternoon,] most unceremoniously disturbed the officers at dinner by the unprepared "report"—"There's five feet water in the hold, sir."

* The occurrence took place in Port. The author, on that day, happened to be a guest at the gun-room-table. The scene of confusion is spared to the reader.

CAULKING AND SCRAPING.

THE caulker should never be permitted to "*pay*" his work until the scraping-party have ready at hand water, swabs, and scrapers. As soon as the pitch is cold, and thoroughly set, the seams should be sprinkled and swabbed, and immediately scraped. The scrapings should be collected, and lowered over the *stern*.

Displacement of each Ship and Vessel when Launched, and when at Sea.

Rate in Guns....	120	80	74	Razee 50	52	46	Razee Corvette 26	28	Corvette 18	Brig 18
	Tons. Cwt.	Tons. Cwt.	Tons. Cwt.	Tons. Cwt.	Tons. Cwt.	Tons. Cwt.	Tons Cwt.	Tons. Cwt.	Tons. Cwt.	Tons. Cwt.
Weight of the hull when launched....	2466 18	1882 6	1616 15	1447 18	1042 12	795 3	698 0	413 17	281 3	213 10
Weight received on board	2142 5	1723 14	1359 11	1044 8	1067 16	670 9	582 0	370 11	326 16	242 18
Total weight when complete	4609 3	3606 3	2976 6	2492 6	2110 8	1465 12	1280 0	784 8	607 19	456 8

(Abridged from "*Edye's Naval Calculations.*")

The following Table shews the difference in the immersion of a ship in fresh river-water and in sea-water; also, the relative quantities of water displaced in proportion to the body of the ship, or to the specific gravity of river and sea-water :—

Rate of Ship, or number of her guns.	Ship deeper in river-water than in sea-water.	Difference in the two load lines, from the specific gravity of fresh and salt water.	Quantity to raise or immerse the Ship an inch at the load or sea line.
	Inches.	Tons Cwt.	Tons Cwt.
120	5⅞	Equal to 143 8	24 0
74	5⅛	,, 93 14	17 17
46	3⅝	,, 45 6	12 5
28	3¼	,, 24 6	7 9
18	2¾	,, 14 6	5 13

FIRST COMMISSIONING.

SHIP'S FORMATION.

If the ship be in dock, the carpenter is recommended to make himself thoroughly acquainted with the formation* and peculiarities of her *bottom*. Fore-knowledge of a vessel's "build" has

* "The notion that ships ought immediately to taper, or become narrower from the midship-bend or frame, in order that the closing of the water behind them may push them forward, is a vulgar error. That the shape of fishes ought to be copied in ships is another; for what analogy can there be between the form of fishes, and the manner in which they move by the action of their tails, and the compact body of a vessel, which is impelled by her sails? The length of tail in a fish is necessary to its velocity, which naturally carries the extreme breadth near the extremity, with a certain strength in the shoulder to put that tail in motion. The analogy does not hold good. Yet these ideas have caused great blunders in naval architecture."—*Admiral Patton.*

often been attended with beneficial effects. In situations of peril, acquaintance with the ship's construction may not only be the means of allaying much of unnecessary alarm, but of suggesting expedients for surmounting difficulties, and escaping dangers, which, in all probability, never would have emanated from a mind ignorant of the vessel's form.*

* The above observations are borne out by the following fact:—A ship, in which the author served, had, when working out of one of the long loughs on the N.W. coast of Ireland, got a-ground in a position exposing the vessel to considerable danger. The captain's commission (which was considered in equal danger with the ship) had hardly been read twenty-four hours to the crew—the new commander having only superseded his predecessor on the preceding noon. The ship had completed her ninth tack, and, in attempting the tenth, struck in stays, on an unknown shoal, or rather an undiscovered reef. In consequence of a long, rolling, ground-swell, the ship forged in with the shore, thumping the ground with considerable force. The boats were immediately hoisted out—anchors and cables laid in the desired direction—top gallant-yards and masts struck—preparations made for striking the top-masts; when, just as the captain had directed the booms to be cast adrift, for the purpose of procuring spars to shore-up the ship, the carpenter thus addressed him:—

"Sir, there's no occasion whatever for a single shore. From the formation of the ship's bottom, her floor will prevent her ports taking the water."

"Are you perfectly sure of what you assert?"

"I've been six years in the ship, sir; and I'll forfeit my head if she falls over another inch."

"Keep fast the booms," returned the captain; at once confiding

EXAMINATION OF THE SHIP'S HULL, &c.

THE carpenter will be required to examine every part of the ship's hull, the magazines, store-rooms, and cabins, and report to the captain or commanding officer all defects he may find.

INSPECTION OF MASTS AND SPARS.

PREVIOUSLY to leaving the mast-house, the carpenter should inspect the masts, yards, and spare spars of the ship; and he should be particularly careful that the spare lower cap properly fits. If the lower masts be already in, he must remind the commanding officer of the necessity of *trying* the cap aloft. If the mast be not in, the mast-heads should be well greased before they are launched into the water.

"FITTED FURNITURE."

THE carpenter is recommended to try, and satisfy himself that all articles that come under the mis-

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in the carpenter's report. The prediction of the latter proved to be correct; for, though an hour-and-a-half a-ground, the ship never required a single shore.

nomer of "fitted* furniture" *do fit.* The following list may serve as a guide:—

Sole Supply.	*Spare Supply.*
Rudder-chocks.†	Boom-irons.
Bucklers.	Pump-boxes.
Horse-plugs.	Tiller.
Dead lights.	Wheel.
Rollers for messenger.	Lower and top-mast caps.
Chain cable, levers, and instruments of stopper.	Iron rollers, and sheaves pertaining to chain topsail sheets and ties.
Cat-head and shank-painter.	
Apparatus for disengaging the anchor.	

DRAWING STORES—TRANSPORTING SPARS.

Upon every occasion of drawing stores, but particularly in transporting spars of a heavy nature, the carpenter should pre-arrange with the senior lieutenant as to the *time and tide* best suited to the purpose.

He should also consult with the master upon the propriety of nailing battens between the beams on the orlop or after-hold, for the purpose of stowing

* It is singular that this designation should be given to articles which are frequently found *not* to fit

† Captain Hayes, the naval architect, has invented an admirable rudder-chock. It is merely a catch of iron, and is far more simple and manageable than the two cumbrous blocks now in use.

away spare plank. Nor should the spare anchor-stocks be stowed until the sanction of the senior lieutenant be obtained.

BAR AND BOLT IRON.

ALL bar and bolt iron should be stowed securely between the beams in the after-hold overhead, and on no account kept in the *store-rooms* or *wings*.

DOCK-YARD ARTIFICERS.

WHEN the dock-yard artificers are employed afloat, the carpenter should avail himself of their several services in the fitting of those lockers necessary for the stowage of spare geer and rigging tools. The stoppers for the lower rigging should always be kept at hand upon deck. A locker is sometimes built upon the forecastle, for the convenience of placing these, and other articles of fitted rope. The forecastle is best suited to this purpose. The locker then is under the eye of the boatswain.

HAMMOCK CLOTHS.

BEFORE removed from the dock-yard, the carpenter should be cautious, that the painted hammock-

cloths be properly dry. He should consult with the senior lieutenant, as to the manner in which the hammock-nettings are to be fitted.

BOATS IN THE BOAT-HOUSE.

THE carpenter should occasionally visit the boat-house, and, upon each visit, report to the senior lieutenant the state of forwardness, or readiness of the ship's boats. Before finally leaving the Camber, he should see that their 'furniture' be complete in every repect; he is recommended to request that the boat-builder may fit the bottom-boards of all the boats with small staples and toggles. By this plan, the bottoms of the boats can be cleaned with facility. When the bottom-boards are nailed to the timbers the nails require to be drawn, and to be again driven, on every occasion when it is necessary to cleanse the bottom of the boat. The system of nailing and re-nailing the bottom-boards tends materially to injure the timbers of the boat.

HINTS.—See shipped the awnings, stanchions, in all the boats, and examine well the launches, windlass, and carronade-slide.

PATENT CAPSTAN—FORCE-PUMP.

SHOULD this pump, capstan,* or aught of other machinery pertaining to the ship, be fitted on a new or experimental plan, the carpenter should make himself acquainted with their respective properties, peculiarities, and mode of action.

LIME—PITCH—OAKUM.

THE carpenter is cautioned to receive no lime on board unless it be properly *slaked.* Nor is his yeoman to stow loosely below old canvas, picked oakum, or pitch.

LINING AND PAINTING THE SHIP.

WHEN it is necessary to "line"† the ship, preparatory to painting, the carpenter will accomplish his purpose with more of accuracy, and less of

* It becomes requisite to examine, and oil occasionally, the external machinery of Phillips's capstan.

† When a good line has been struck off, it is recommended to place a small feather-edged batten on the upper line at least: by this precaution a correct line will always be preserved. The battens should be nailed on with *copper* nails.

trouble, by not following the common-place practice of tacking the lead-line along the side. Battens are best suited to the purpose, and are "dropped," or raised, with equal ease.

HINT.*—The formation of a "*line* is better effected by white-wash than by other means;" and at all times previously to laying on paint, pitch, and tar, spots on the ship's side should be *scraped* with knives in preference to scrapers.* It is always desirable, particularly in the white line, to insert a little white-wash into the pitch seams on the side, filling them up afterwards with pliable putty, containing a considerable portion of white lead. It is not recommended to blacken the bends; and the bends should be plained previously to painting. Paint will always look better, and will never, like blacking, turn brown from the combined effects of the weather and salt water. Moreover, in hot climates the copper will never be disfigured. Ships which black their bends have always their copper streaked with the droppings of the blacking from above.

* When the painting of the ship is finished, the carpenter should collect all the brushes, cleanse them, and put them into fresh water.

PAINTING YARDS.

It were much to be desired, that the practice of blackening yards were abolished. Paint will be found to preserve the wood equally well; and, when working aloft, the clothes of the seamen will never be damaged. At all events, the top-gallant and royal-yards were better painted, if officers are desirous of keeping the top-rims clean.

PENDULUM—SHIP'S INCLINATION.

The carpenter should consult the senior lieutenant as to the position in which it may be deemed desirable to place the "Pendulum," which is to denote the heel, or inclination of the ship, when at sea. The pendulum is generally made by the armourer and joiner of the ship; but it is to be presumed, that, upon proper application to the superintendant of the dock-yard, this useful instrument will be formed and fitted by the artificers of that establishment.

TOPS AND CAP-SHORES.

As soon as the tops are swayed over the mastheads and properly placed on their respective cross-trees,

the carpenter will cause them to be *immediately* bolted. Serious accidents have occurred from post-poning* this necessary service. Nor should he neglect to bore holes through the bottom parts of the several cap-shores. Through these holes a laniard should be rove, to prevent the possibility of a cap-shore† falling from aloft when at sea.

FIRE SCREENS.

THE fire-screens pertaining to the magazine hatch-ways of the different decks should be fitted and tried as early as possible.

SPARE TOP-MASTS, &c.

THE carpenter is cautioned to remind the senior lieutenant of the absolute necessity of *fidding* the

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* The author recollects an instance in which the tops of a sloop-of-war were discovered floating in Porchester Lake the morning subsequently to the evening when they had been swayed aloft and placed upon the cross-trees. The tops had been got over somewhat late in the evening, and the carpenter, considering them perfectly secure, permitted them to remain unbolted for the night. A gale of wind came on in the first part of the middle-watch, and the tops were found missing *in the* morning.

† In some ships, cap-shores are dispensed with; but it will be found, particularly upon striking top-masts, that the weight of the spar and top-mast rigging brings a considerable strain upon the fore part of the cap, which causes it to droop and bind the mast in the cap.

spare topmasts, and of running out all the studding-sail booms before they be finally stowed on the skids. These precautions are frequently neglected; and hence it is when ships go to sea, and have occasion to shift a spar, that a topmast binds in the heel, and requires considerable alteration before it can be *fidded*. The same remarks are applicable to the studding-sail booms.

STOWING BOOMS.—Vide *Boatswain—First Commissioning*—under the head of "Stowing Booms."

MOULDS FOR ARMOURER'S WORK.

WHEN it is requisite to fit hammock-stanchions, or to insert rollers in the hoops of the masts, the carpenter should be cautious to give accurate models to the blacksmith. He should also take the moulds himself to the master blacksmith, in order that no mistake may be made by the journeymen when working at the forge.

INDENTING.*

THIS indispensable duty is too often deferred to the last moment. The carpenter should recollect

* The indents and supply-accounts must be carefully examined in order to ascertain, before the ship leaves the port, that every article inserted therein has been actually received. And it is to be

that, previously to putting to sea, his services are of more consequence afloat than ashore. The *hint* will suffice.

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understood, that, if any of the boats, oars, or other stores, allowed for harbour-service, be taken *to sea*, the value of the same will be charged against the warrant-officer's pay."—*Naval Instructions*.

IN PORT.

THE duties of the carpenter in port will depend upon the repairs that the ship will require. He should, however, in harbour, as well as at sea, return a report to the commanding officer, touching the state and condition of the ship, and particularly of the *boats*.

TURNING THE HANDS UP.

WHEN the hands are turned up for the performance of any specific evolutions—crossing top-gallant-yards, loosing or furling sails, hoisting in, or out, boats—he is not to dispute with the mate-of-the-main-deck, or question the propriety of proceeding with work in-hand, or of "breaking the

carpenters off," but, unless especially directed by the commanding officer, he should encourage his crew to hasten to their respective stations.

PUMP WELL—HOT CLIMATE.

If in a tropical climate, he is recommended to pay particular attention to the state of the pump-well, and to suggest to the commanding officer the adoption of the purifying practice of introducing water into the well, and pumping it out twice or thrice during the night. This practice* will be found to cool the air on the lower deck.

FIRE ENGINE.

At sun-set, he should report to the commanding officer, the fire-engine and force-pump in order for use, and that the winches of the chain pumps are ready for shipping.

SHIP'S DRAUGHT OF WATER.

The carpenter should obtain the ship's draught of water as soon as possible after the ship has anchored

* The propriety of this practice has been disputed, but it has been adopted in many ships with considerable success.

in port. Previously to leaving port, he will do well to return to the master an official report of the draught forward, aft, and particularly at the midship port of the lower deck.

RUDDER COAT.*

THE carpenter should see that the rudder-coat be in perfect repair, and that the tiller be firm in the rudder-head, previously to putting to sea.

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* Vide "Practical Hints," for dimensions of Rudder-coat.

AT SEA.

DAILY INSPECTIONS.

MORNING.—As soon as the decks are washed and dried up, the carpenter should examine the masts and yards aloft, and report to the officer-of-the-watch their state and condition.

EVENING.—He will be required at evening-quarters to inspect the wings, &c. in order to satisfy himself that the shot-plugs, mallets, and mauls, be placed at hand, and every thing in his immediate department ready for action; he will report accordingly to the senior lieutenant. Should the wings or passages in the vicinity of the ship's side be obstructed by lumber of any description, he should

make known the circumstance to the commanding officer.

BARRING IN STERN AND LOWER-DECK PORTS.

In the ship-of-the-line he should superintend the barring in of the lower-deck ports, and, when completed, report the same to the senior lieutenant.

In the frigate, or flush-deck vessel, he will consider the same directions to extend to the stern ports.

In the latter vessel, the carpenter should be careful that before night-fall the gratings be shipped, the tarpaulings placed, and that the dead-lights, and every requisite for battening down be in readiness, in the event of it coming on to blow. When the hammocks are piped down, he should report to the senior lieutenant that the above preparations are made.

REPAIR OF BOATS.

The carpenter should constantly examine the boats on the booms, quarters, &c., and report to the senior lieutenant on every occasion that they may appear to him to require repair.

INSPECTION OF SPARE SPARS.

He should, from time to time, examine the spare spars, particularly the top-sail and top-gallant-yards, and see that they be always kept in a state of readiness for immediate use; that all their pins, sheaves, and sheave-holes be in due order, and that their respective cleats be properly placed.

GOING INTO PORT.

Hints:—Present-use demands to be made out for captain's approval. If annual accounts are due, apply for survey on "*Remains*"—Demands to complete—Ship's defects—Take off hause-plugs bucklers—Obtain draught of water.

PRACTICAL HINTS.

STABILITY.*

"It frequently happens that ships which have been at sea are said to require an increase of masts and yards; and the necessity of making alterations is suggested, by the impression of experienced seamen, who compare the inclination or heel of the ship, on which they offer an opinion, with the performance of other vessels, whose character they happen to know. In this manner the question becomes one of *comparison.*

Assuming that nautical men can speak with confidence on this point, without the opportunity of

*Abridged from "Chatfield's Pamphlet on Naval Architecture."

experimenting with other vessels—that we have the means of trimming a vessel to any required lateral inclination, by way of trial—those who are competent to decide, whether she heels too much, or too little, may also determine, on the same principle, what would be the proper deflection when certain sails are set, and every weight on board in its proper place.

Nothing is more common than to say that a ship wants so many feet taken off her lower masts, or that they want that quantity added; but, however obvious may be the necessity of a reduction or increase of spars, it is, at best, speculation to venture an opinion as to quantity upon any authority not founded on calculation and scientific considerations.

Opinions of ship's qualities are mostly given in too *general* terms. The following are usually found in the official report of the ship's sailing qualities :—

STABILITY AND ROLLING.

" How does she stand under her sail? "

" Crank—rather inclined to be crank—well—pretty well—very well—stiff—very stiff—crank with lofty sail stiff, with lower, &c. &c."

Statements of this kind may serve to give a general idea of a ship's character and "behaviour at sea;" but such reports cannot answer the purposes of a naval architect, who can only improve known imperfections in construction by possessing data, which will enable him to go into the nicest calculations; consequently, if a vessel be called "crank," the reporter should state the angle to which she inclines when he thought her *too* far depressed; also, the quantity of sail then set; the sea running, and the state of the weather. He should likewise give an opinion, stating the number of degrees beyond which he conceives the ship ought *not* to have heeled.

The great evil of undefined expressions, such as "Well"—"pretty well"—"very well," &c., is, that no two persons, perhaps, mean the same thing, when they explain themselves in that manner; "well" being a matter of opinion, and, therefore, leaving only a relative signification. Different persons too, in the same ship, possibly may give different accounts; hence the necessity of definite terms.

Another part of the "report," which refers to the stability of the ship, is as follows:—

"*How does she carry her lee ports?*"—"Low" "rather low"—"very low."

Now the height of *port-sills* above the water in tempestuous weather should be sufficient to avert any inconvenience that may arise from the undulations of the sea. There are, also, other things—such as the disadvantage of fighting against a more elevated battery, &c. Information respecting the height of ports should be expressed in "feet and inches," and may be best ascertained from the drawings of a ship, after having learned the angle to which she was inclined; it being utterly impossible to speak with accuracy from actual measurement at sea.

The ROLLING of a ship is stated as follows:—

"How does she roll?"—"Deeply"—"quickly"—"easily," &c.

These terms are extremely inexplicit, and perfectly unavailable to scientific navigation.

A report on ship's sailing qualities is supposed to be a very perfect statement of their actual performance at sea; *opinions* should, therefore, come under the head of "Remarks."

An instrument for measuring a ship's inclination may be always used with advantage; and were it

generally established, and the results of observations carefully attended to, it would lead to much good in advancing the theory of construction.

For example, if a ship be pronounced to be "over"-masted, observe her inclination when she is said to be too far depressed. Suppose that angle to be 13 degrees; then, by the adjustment of the weights on board, or by shortening sail, trim the ship to the angle beyond which it has been determined she ought not to heel,—say 10 degrees, under the first circumstances of carrying sail, &c. If the inclination be diminished to the approved angle of 10°, by the method first proposed—viz., an adjustment of weights—the result required must be obtained by calculating the stability of the vessel at 13°, also at 10°, and by making use of the following proportion:—

Calculated Stability at 13°	:	Calculated Stability at 10°	::	Moment of sails given	:	Moment of sails required.

The fourth term of this proportion will furnish the requisite information for correcting the rigging draught, or making a plan of sails on a reduced scale; and the quantities made use of had better be previously collected in a table of the annexed form:—

Ship's absolute inclination.	Sails set.	Rate of sailing.	Remarks on the weather.	Angle to which the ship should have inclined had she possessed proper stability, determined by a comparison with other vessels, or by the opinion of competent persons on board.
13° or 8°	Courses, top-sails, top-gallant sails, jib, fore-top-mast stay-sail, and spanker.	8 knots 6 fathoms.	Fresh breezes.	10°

But if the inclination be lessened by *shortening sail*, the exact quantity and disposition of the sails then set must be carefully registered; their moment may then be calculated, which will at once be the result required.

In the next place, suppose a ship to be *under-masted*, or to require an increase of canvass, then proceed as follows:—

Observe the degrees of inclination to which the vessel actually inclines, (say 8°,) then, by an adjustment of the guns, or other great weights, cause the vessel to be deflected to the adjudged angle, (say 10°,) as in the last experiment. The following

proportion will then give the proper moment of sail :—

Calculated Stability at 8°	:	Calculated Stability at the greater or approved angle 10°	::	Moment of sails given	:	Moment of sails required

LEAKS—PRESSURE OF WATER AT DIFFERENT DEPTHS.

"WATER," says Gower, "presses at the square-root of its altitude; that is, suppose equal holes be made in the bottom of a vessel at one foot, four feet, nine feet, and sixteen feet, *beneath* the surface of the sea, the water will rush in at these holes with a velocity equal to the square roots of their respective depths. For example,* at the four-feet hole

* Between the above example, given by Mr. Gower, in his "Treatise on Seamanship," published in 1808, and the following Case, published by William Hutchinson in 1787, there will be found a *close* similitude :—

Case—"If a ship has the flattest part of her bottom lying sixteen feet deep (which is often the case), the water then presses sixteen times as much upwards against this flat part as it does upon any part of the same ship about the water's edge, and so on to any other part, according to its depth. For example, suppose this ship to have four leaks, or plug-holes, of equal bigness, that could be driven out occasionally,—the first at *one foot* under water —the second at *four feet*—the third at *nine feet*, and the lowest at *sixteen feet* in the flat part of her bilge; that hole at *four feet* deep would leak or let in as much water again, in the same time, as that at *one foot* deep; and that at *nine feet*, three times as much; and

it will rush in twice as fast as at the one; at the nine feet, three times as fast; and at the sixteen feet, four times as fast; which is the law it will follow, provided the water be pumped out as fast as it comes in. But if the water be suffered to rise in the vessel, and to cover any of the holes, the covered holes will then run with the same velocity, regardless of their depths,—which velocity will be as the square-root of the difference between the level of the water *within* and without the vessel. For instance, let it be presumed that the hole of sixteen feet was quite at the *bottom** of the vessel, and that the water had risen in her twelve feet; then, as its surface is even with the four-feet hole, those two which are covered will run with the velocity only of

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that at sixteen feet, four times as much, though it run into the ship upwards, and so on in proportion to the square-root of the height of the water above the leak or plug-hole. Therefore, leaks in ships are more or less dangerous, according to their depth under water."

* The reader will perceive that the writer, contrary to custom, counts downwards from the surface. His illustration will be made more intelligible by the following extract, which is here cited as an explanatory passage:—

"On first springing a leak, it will rush in faster till the water inside is as high as the place where the leak is, and will pour in *less* the higher it gets inside."—*Griffiths's Practical Hints.*

that hole in the four-feet position, since four feet is the difference of the water within and without the vessel. Hence, if a ship spring a leak under her bottom, although the water should increase upon the pumps at *first*, yet after it has risen to a certain height above the leak, the pumps will then be able to prevent its rising higher." *

How to Discover a Leak at sea.—The following rules may lead to the discovery of a single leak :—

1st.—Should the ship increase making water as she sails, the leak is in the bow; but if, on the

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* In a frigate in which the author had served, this fact was somewhat paradoxically *defined* by a lieutenant of the ship, a native of the Sister Isle. The ship, during a heavy gale of wind, struck upon a dangerous shoal; six feet water was soon in the frigate's hold; and upon the captain's expressing his apprehension that the "people at the pumps could not possibly *keep the ship free*," the Milesian lieutenant immediately replied—"Don't be *unaisy*, Sir,—the *more* that comes in, the *less* there'll be!"——This Hibernianism produced a laugh, though it was no laughing matter. Still, upon further inquiry, Pat's theory, bordering as it was upon the *bull*, was, nevertheless, discovered to be founded upon philosophical principles.

The truth is, the lieutenant "was no fool;" his object was to produce a laugh, and to put to the test of truth the old adage, "Let those laugh that win." They did *win*. The people gained on the leak.

contrary, she decreases making water as she sails, the leak is in the stern.

2dly.—If, when sailing before the wind, the ship makes neither more nor less water, the leak is on either side, which side may be discovered by bringing the ship to the wind; if the ship then makes more water, the leak is on the lee-side; if less, it is on the weather-side.

It has been asserted, that, by following round a leaky vessel, in a calm, with a pole, keeping one end applied to the ear, and the other to the vessel's bottom, a rumbling noise will be heard vibrating up the pole, if its end happen to pass near to the leak. By this method the position of the leak may be discovered.

TO FISH A LOWER-YARD IN THE SHORTEST TIME.

INCALCULABLE are the evils which may result to a vessel from the "springing" or snapping of a lower-yard, especially the *fore* one. A ship may be placed in so perilous a situation, and time so pressing, that the very existence of the vessel may

depend upon the *despatch* with which this important spar can be repaired and replaced.

The following strong and expeditious method has been twice tried, and with eminent success:—

If the yard be severed, get both pieces down on deck, and place them together to assume, as nearly as possible, their original position. Hollow out, so as to fit the cylindrical surface of the yard, two spare-anchor stock-pieces; in doing which, a depth of two or three inches will suffice. Place one piece on the top, and the other secured to the under part of the yard. Towards their extremities dub down the superfluous wood, and round the edges, ready to receive the requisite wooldings.

Preparatory to boring holes for the bolts, set close to the anchor-stock-pieces, with wedge upon wedge. Introduce then eight or ten bolts of inch or three-quarter-inch diameter, which must be severally clinched. Cut scores for eight or ten wooldings, and woold-away with *well-stretched* rope of three or three-and-a-half-inch. The yard may then be replaced aloft. There will be found no necessity for studding-sail-booms, or other spare spars.

This method has been transmitted to the author by one of the most experienced seamen and intelligent officers in His Majesty's Service.

"In two instances, on board of 44-gun frigates, I witnessed," says the writer, "the success of this expeditious plan. In the first, the main-yard went in two pieces, about ten feet from the slings. The accident occurred at eight A. M., and at six P. M., on the same day, the main-yard was in its place, and the main-sail set.

"In the second instance, the fore-yard was carried away about the same distance from the centre, and was repaired and replaced in about the same interval of time.

"Both ships, for several weeks subsequently, had to contend with heavy gales and bad weather, yet the repaired yards stood as well as they did prior to the accident."

To MAKE A TEMPORARY LOWER YARD.—"When a lower yard is entirely carried away at sea, it is not uncommon to make a yard with the spare spars supplied to the ship. This is frequently done by bringing two studding-sail booms end to end, which together makes up the length of the yard;

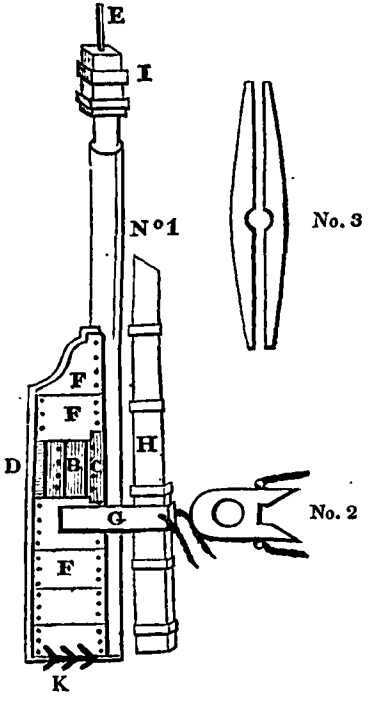
then to scarph them by bringing the spare topsail and top-gallant-yard in the middle, and other small spars, as top-gallant studding booms, &c., to make up the form of the yard. When the different spars are so placed as to overrun each other in the best possible way, they are then well woolded together, and the yard is formed.

"The rolling of the ship makes it frequently difficult to keep the spars together, till woolded; in which case it is better to lay any inferior pieces on the deck, as skids, and fix the lower ends of some capstan-bars into them, with their upper ends guyed to the sides of the ship; by this means the different spars may be kept sufficiently steady to woold in a proper manner. Whatever part the wooldings are applied to, it is necessary to fit chocks between the spars to keep them firm, and for the woolding to lay fair over them, so as not to *wound* the spars."*

* "Mast-making."

PACKENHAM'S TEMPORARY RUDDER.

THE following figure is intended to illustrate this admirable invention.



No. 1, is a top-mast inverted, which forms the main piece of the rudder, the heel of the top-mast becoming the head of the rudder, and which

is so secured by anchor-hoops, *I*, that the fid-hole may be increased to receive a tiller. This main piece is pointed through a top-mast cap, which is enlarged, that it may turn freely in it. No. 2 is a representation of the cap, with its square part cut out to fit the stern-post, having fixed to it the top chains. *B*, No. 1, is the inner half of a jib boom; *C*, the outer half; *D*, a fish; all of which are firmly bolted to the main piece, and planked over, as *F F F*, &c.; *K*, pigs of ballast to sink the heel of the rudder; *E*, a rope to suspend the rudder; *G*, the cap, as fitted to the rudder; No. 3, anchor-stocks cut out to receive the round part of the main piece of the rudder. The whole machine being prepared, it is then got under the stern, and the head of the rudder hove up through the counter to a necessary height. To each of the top-chains, bend the end of a hawser, taken from the hawseholes, on each side, and, bearing the rudder a midships, heave well taut both hawsers, and the cap will become firmly secured to the stern-post, *H*. This accomplished, the anchor-stocks are next to be secured round the rudder head to the deck it comes through, in order that they may act as an upper gudgeon in which

the rudder is to turn. The tiller &c. being fixed, the rudder may now be considered as complete and fit for service.

GRIFFITHS'S JURY RUDDER.

Captain A. Griffiths has also proposed a plan for a temporary rudder.

The loss of a rudder is generally the result of a ship getting on shore, at which time it not unfrequently happens, that the vessel either loses, or is compelled to cut away, her masts. In such case, the inventor considers that the cap and top-mast can be very ill spared. He therefore thinks it best to make the rudder out of the two spare "Fish;"* and thus proceeds:—

"Let the fish be cut off the requisite length, the heels brought together, and the upper ends, where the tiller is to ship, exactly the width apart necessary

* "In my own opinion," says the inventor, "these are the better material, and can at all times be better spared, on the principle, that, if necessary, a 'top-mast' can be very readily converted into a *fish*, but the fish cannot become a *substitute* for the top-mast." Captain G. states, that an admirable rudder for the 'Abraham Newland,' a West-Indiaman, of near 700 tons, was made on this principle.

to admit the tiller,—to become, in truth, the tiller-hole. A yard-arm piece, or any broken spar, for the filling piece,* in the vacancy thus left between the two fish; and another filling piece in like manner *above* the tiller hole. Then bolt the two fish and filling pieces together, and secure the head by the anchor-stock hoops. The rest to be made the same as if the top-mast had formed the same piece; only perhaps it would be better to bolt these back pieces on, so that the bolts may take hold of both the filling piece and fish, to be driven a little slanting, or diagonally.

"The security against the pressure of the tiller is greater than in the top-mast, where the substance of the fid-hole is to be so *much* cut away.

"Where the cap is to form the lower security the fish must of course be *rounded.*"†

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* Doubtless the author intended to have said, "may be used;" the sense of this sentence is incomplete if this expression be not employed.

† "Practical Hints."

Comparative Weight of Timber in a Green and Seasoned State.

Description of Timber.	Cubic Feet.			
	Green.		Seasoned.	
	lbs.	*oz.*	*lbs.*	*oz.*
English Oak	71	10	43	8
Dantzic Oak	49	14	36	0
African Teak	63	12	60	10
Indian Teak (Malabar)	...		52	15
Indian Teak (Rangoon*)	...		26	4
Indian Mast Peon	48	3	36	0
Cedar	32	0	28	4
Larch	45	0	34	4
Riga Fir	48	12	35	8
New England Fir	44	12	30	11
Elm	66	8	37	5
Beech	60	0	53	6
Ash	58	3	50	0

* The Malabar Teak is the heaviest, and the Rangoon the lightest, of all Indian Teaks used in ship-building.

Note—The average weight of the timber materials in a ship or vessel-of-war is about 50 lbs to the cubic foot; and for the masts and yards about 40 lbs.—*Edye's Naval Calculations.*

TEST OF SPAR TIMBER.

"To become familiar with the different kinds and qualities of fir timber, requires considerable practice and close observation, with, likewise, a proper acquaintance with some of the general appearances that distinguish these qualities. The firs most desirable are those of the fine and close grain,—the wood strongly charged with resin, which is not only beneficial in giving strength and elasticity, but preserves the timber from insects, and prevents fermentation and decay. The colour should be of a clear bright yellow, with a reddish cast alternately. The smell in the Riga firs, and others of this quality, should be strongly resinous, especially when they are exposed to the sun, or any other heat, or when their shavings are rubbed between the fingers. On the contrary, when the layers are separate, porous, or open, with tints of a pale red near the heart, and white spots intermixed, or of a dark red, with the resinous particles of blackish colour, the timber is in a state of decay. In yellow and red pines that have not the strong resinous smell, the degree of unsoundness is denoted by the offen-

siveness of the smell; and they will, in common with other firs, have alternate layers of a foxy brown or red colour, and will break out before the sharpest plane in being wrought.

The experienced mast-maker forms his opinion of the quality of a stick, not only from the colour, smell, and appearance of the grain, but by its working; for a stick is more or less frough or fragile, the greater or less difficulty he has in separating its parts, as he chops them off. If the timber is good, its parts, on being separated, appear stringy, and oppose a strong adhesion; and the shavings from the plane will bear to be twisted two or three times round the fingers; whereas, if the stick is of a bad quality, or in a state of decay, and has lost its resinous substances, the chips and shavings come off short and brittle, and with much greater ease."*

TO DISCOVER DEFECTS IN MASTS, &c.

SPRUNG SPARS.—Springs are discovered by shans and fractures, and sometimes by the fibre suffering

* "Papers on Naval Architecture."

by compression, while the continuity of the fibre is not wholly overcome;* shans are mostly in consequence of the defect of the materials, most commonly from bad collared knots, and from the range of fibre not being in a direct line with the mast, &c. Fractures are generally discovered in two forms, one with a *black* waved and jagged line across the mast, &c.; the other forming, between shakes or longitudinal openings, short fractures, that rise one above the other, in the form of steps: this is commonly called "Jacob's Ladder." This fracture in general takes place in *single*-tree masts and topmasts. It is a defect that seldom admits of repair.

When the mast *complains*, or gives any sign of weakness without any external appearance of decay or fracture, it may be considered as arising from internal defect, especially if the mast has been in service more than five years.

MAST-BUCKLEING.—When any part of a mast &c. suffers by compression or buckles, or what is technically called, having the "grain upset," and the fibre, in different parts, takes a sinuous form,

* This compression of timber is discovered in new sticks or trees.

it is a proof of considerable weakness, and that it must, if a *made* mast, have worked considerably. This defect, however, is common to masts of small vessels, that have considerable rate.

DEFECTS OF LARGE LOWER MASTS. — The defects of made masts are thus discovered:—If for *decay*, the mast is generally bored with a very small auger, about three feet apart, or at the lower edge of each hoop, into the centre, boring them alternately athwartships and fore-and-aft. Search is also made in the place of the wedges at the different decks, and at the edges of the cheeks, &c. When fractures are discovered, to ascertain their extent, thick shavings are taken off, with a plane first, and if the *black* mark of the fracture still appears, take a chisel, and penetrate, by taking off small portions at a time, till the defect begins to disappear; then the depth of the incision will determine whether the mast, or that part of the mast where it takes place, ought to be condemned. If a Jacob's ladder, a chisel is made to pass between the shakes.

To discover the defects of a mast to the greatest certainty when it appears *weak*, without any *visible*

defect, it is common to take off the cheeks, drive the body-hoops off, and take out the aris pieces, to give an opportunity of examining the edges of the fore and after fish, and side trees. All masts, yards, &c., when properly examined, should have the paint or other substances taken off their surfaces, and planed all over, to shew the smallest defect.

LOCALITY OF FRACTURES.*—"In *made* masts fractures mostly take place from the tail of the cheek to the deck, though frequently the mast becomes buckled from the middle of the cheek upwards; but this commonly takes place through improperly *staying* and setting-up the rigging, and at the *wedges*,† especially at the head of them,

* By reference to Mr. Fincham's valuable work on Ship-building, published in 1821, it will be seen that the paragraph 465, p. 174, under the head of "Fractures," is not sufficiently clear to be extracted verbatim. A liberty, therefore, has been taken with the original text.

† Doubtless the author of a work, recently published, on Rigging, under the *title* of the "NAVAL OFFICERS' GUIDE," never perused the above passage when he so strongly *recommends staying* masts with the *wedges in*! "I feel satisfied," he says, "that prejudice and custom will be much opposed to this, and many officers who have not been employed for years, and think *their own* way *best*, will not only condemn the plan, but all who approve of it; but a trial will always confirm what I have stated."—p. 48.

Passing over the *perspicuity* of the latter sentence, the argument is thus answered. Officers who have not been on *shore* for *years*,

fractures are often found. In *single tree* masts without cheeks, springs are found most frequently at the lower part of the hounds and wedges. In top-masts, fractures mostly take place at the lower part of the hounds, and at the cap. *Bowsprits* are most generally discovered to be sprung on the upper part principally, and the sides between the gammoning and the chock or bend."

PROPORTIONS FOR MASTS AND YARDS.

THE following is the scale for the length and diameter of masts and yards, which, almost from time immemorial, has been established in the naval, as well as in the civil, service. It is now, however, in the contemplation of the present Surveyor of His Majesty's navy to establish a newly graduated system, the rules of which are not yet promulgated, though doubtless they will be found of the utmost utility. Some original and highly intelligent views of the

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and who are known to be seamen of equal experience with those authorities the writer so vauntingly cites, not only condemn the practice, as contrary to all mechanical principle, but would very properly "*charge*" the master with the damage done to a mast, by a procedure which can never receive the sanction of *common sense*.

subject have, in the mean while, been developed by Mr. H. Chatfield, of Plymouth Dock-yard, in his lately published elementary essay "On the Principles of Masting Ships," which may be consulted by the profession with much advantage.

LENGTH OF MASTS.

MAIN-MAST.—The length of the lower deck, and the extreme breadth of the ship added together, and divided by two, will give the length* of the main-mast. For example, the length of the lower-deck of a seventy-four-gun ship is one hundred and seventy-six feet; the extreme breadth is forty-eight feet eight inches; added together, these numbers will give two hundred and twenty-four feet eight inches: the half of this number will be one hundred and twelve feet four inches, which is the required *length* of the main-mast. This being determined, the other masts bear the following proportions:—

FORE-MAST—Eight-ninths of the main-mast, which will be about ninety-nine feet and a half.

THE MIZEN-MAST—Of a first-rate, seven-eighths; ships from eighty to fifty guns, six-sevenths; and vessels from forty to twenty-eight guns, about five-sixths of the main-mast.† When the mizen-mast steps

* In brigs, the length of the main-mast is thus ascertained:—The depth in the hold is added to the length and breadth, and one-half is the length of the mast.

† In sloops, the mizen-mast is three-fourths of the main-mast.

on the lower-deck, the depth of the hold is to be deducted from the length here given.

MAIN-TOP-MAST—Three-fifths of the main-mast.

FORE-TOP-MAST—Eight-ninths of the main-top-mast.

MIZEN-TOP-MAST*—Three-fourths of main-top-mast.

TOP-GALLANT-MAST†—Half the length of top-mast.

BOWSPRITS—Of eighty-gun ships and upwards, are generally seven-elevenths of their main-masts. Bowsprits of seventy-four-gun ships and under, are proportioned to about three-fifths of their main-masts.

DIAMETER OF MASTS.

MAIN AND FORE-MASTS OF SHIPS—From one hundred-and-twenty to fifty guns inclusive, are generally one inch in diameter at the partners to every *yard* in length. From forty-six to the smallest class of frigates, are generally nine-tenths of an inch to every yard in length.

MAIN-MASTS OF BRIGS—One inch to every yard in length, and the fore-mast nine-tenths of the main-mast.

MIZEN-MASTS OF SHIPS—From first-rates to seventy-four's inclusive, three-fifths of the diameter of the main-mast. Fifty-gun ships and under, two-thirds of the diameter of the main-mast.

MAIN AND FORE-TOP-MASTS—One inch to every yard in length to the fore-top-mast.

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* In sloops, the mizen-top-mast is sometimes five-sevenths of the main-top-mast.

† With the exception of the eighteen-gun brig, whose top-gallant-mast in tauntness far exceeds this proportion.

MIZEN-TOP-MAST—Seven-tenths of the diameter of the main-top-mast.

TOP-GALLANT-MAST—One inch to every yard of their length.

ROYAL-MASTS—Two-thirds of the diameter of their top-gallant-mast.

BOWSPRIT—Of ships, from first-rates to seventy-four's inclusive, about two inches less than the diameter of the main-mast. In forty-six-gun ships and under, the diameter is about an inch and a half less than the main-mast.

SEPPINGS'S LOWER-MAST—Is composed of a number of square pieces, each side being one-fourth of the diameter of the mast for large ships, and one-third of the diameter for smaller vessels; these pieces are, in length, according to the length of the mast, and are placed end to end, according to the butts of the hoops.

The masts are formed to have both ends alike, to afford an opportunity, in case of defect or injury, by placing either end uppermost. Each end is, therefore, made to form the *head*, and of a length the same as the common mast-head. The exterior form of the body of these masts is cylindrical; the parts at each end to the length of the common mast-head, are formed with the angles only taken off, the same as the common heads.*

LENGTH OF YARDS.

MAIN-YARD—Eight-ninths of the main-mast.

FORE-YARD—Seven-eighths of the main-yard.

* "Mast-making."

CROSS-JACK-YARD—Same as fore-top-sail and sprit-sail-yard.

MAIN-TOP-SAIL-YARD—Five-sevenths of the main-yard.

FORE-TOP-SAIL-YARD — Seven-eighths of the main-top-sail-yard.

MIZEN-TOP-SAIL-YARD—Two-thirds of the main-top-sail-yard.

TOP-GALLANT-YARDS—Of line-of-battle ships, are generally two-thirds of their top-sail-yards. In frigates this proportion is varied.

ROYAL-YARDS—About one-half of the top-sail-yards.

DIAMETER OF YARDS.*

MAIN AND FORE-YARDS—At the slings, seven-tenths of an inch to every yard in length.

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* The place of the given diameter of yards is at the slings; the yard-arm always bears a certain proportion to the slings, according to the nature of the yard; and the yard is quartered from the slings to the yard-arm, and which are distinguished thus,—first, second, third, and yard-arm. The proportion for the quarters are obtained by graduating them. Mast-makers effect this through the means of a marked batten, called the graduating batten.

Lower-yards are made of a single tree, or of two pieces scarphed together with a vertical scarph. The yard-arms, in both cases, are five-twelfths the diameter of the slings, when in a *single* piece; the yard is left in the eight squares, at the middle; the after one to half the length of the yard, and the others, which are for the sling cleats and battens, one-eighth the length of the yard. When the yard is formed of two *pieces*, there are no squares left, but the yard is formed to the round, and the battens hollowed. The scarph to the yard made of two pieces, is about one-third the given length, and from three feet six inches to four feet, with the butt-ends of

Cross-jack-yard—Same diameter as fore-top-sail-yard.

Top-sail-yards—Five-eighths of an inch to every yard in length.

Top-gallant-yards—Six-tenths of an inch to every yard in length.

Royal-yards—Vary.

Hint.—The carpenter is recommended to provide himself with a mast-maker's rule, which contains fractional proportions of the different diameters of masts, &c., at their quarters, heads, and heels, as they bear to the given diameters at the partners. On the opposite side of the mast-maker's rule are also proportions for finding the lengths and diameters of all masts and yards, &c.

DIMENSIONS OF TOPS.

The dimensions of tops are as follows:—Breadth athwartships, one-third the length of the top-mast; the length fore-and-aft, two-fifths of the breadth; but to obtain a greater spread to the top-mast-shrouds, tops

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the trees placed together. The lips of the scarphs are made about one inch and a half in thickness, and the scarph is formed straight up and down, to about one-sixth from each end, from which place it increases in round to the lip of the scarph, where it is the same round as the yard, in order that the breadth of the lips may not be too narrow. The scarph has one circular coake under each hoop as far as the surface is straight. The number and place of the hoops on the yard-arms is governed principally by the knots; the hoop nearest the sling is placed about one-seventh the yard out, &c.—Vide "*Fincham on Masts and Yards.*"

are frequently fanned,* from one to two feet on the after part, since breadthening them aft does not affect the bracing of the yards. The whole of the top-mast square are made two-fifths of the breadth.

TRESSEL-TREES.

In length, they are one-quarter the length of the top-mast; in depth, half the given diameter of the mast; and in thickness, two-thirds of the depth.

CROSS-TREES.

In length, they are one-third the length of the top-mast, deducting six inches; the breadth is as much as the tressel-trees are thick; and the depth, two-thirds of the depth.

LOWER CAPS.

Lower caps are mostly made of elm, and in breadth twice, and in thickness, five-sixths, the diameter of the top-mast. The hole for the top-mast is swept to once the diameter, three-quarters of an inch for the thickness of the leather, and one-eighth of an inch for play, and its fore-part is placed once the depth of the cap from the fore-end; from the after part of this hole, to the fore-part of the square hole, is half the taper of the mast-head, and the thickness of the chock between the tressel-trees; this hole is nine-tenths fore-and-aft, and eight-tenths athwart-ships of the size of the mast-head; the fore-part and two sides of the hole are made three-quarters of an inch in a foot towards the upper part, on or from a perpendicular to their under-side,

* A technical phrase for winding.

or what is technically made to strengthen down three-quarters of an inch to a foot, and the after part is square, or made perpendicular through. The wood left beyond the after part of the square hole is equal to the depth of the cap; the four corners of the cap are rounded off to a circle, letting the ends and sides be a tangent to it, and the radius one-fifth the breadth of the cap.

The caps, when made of two pieces, are united at the middle, and have three circular coaks of three-and-half inches in diameter, one placed in the middle between the holes, and one at each end, about the middle between the holes and the extremities." *

MAST-COATS—HOW MADE.

THE mast-coat, when properly cut and fitted in its fixed position, assumes the form of a cone. The material, of which this covering is usually composed, is canvas No. 1; though many officers prefer canvas No. 2. To ensure a close and compact encasement, it is advisable, before cutting the canvas, out of which the coat is to be made, to observe the following mode of admeasurement:—

Girth the mast round at eighteen inches above the deck. Girth also round the deck at three inches from

* Fincham.

the mast-hole. These girths give the circumference at top and bottom. The length is obtained by measuring straight the distance between the places girthed.

Divide the lower girths into an equal number of parts, suitably to the width of the canvas, allowing for the *seams*, which are one inch wide. The clothes must be gored upwards, to produce the circumference of the mast at the top-girth; and, when sewed together, cut with a sweep to set neatly round the mast. The upper part is then sewed into a double collar, six inches wide.

To find the quantity of canvas in a mast-coat, multiply the number of cloths by the length, and add the quantity in the collar:—

EXAMPLE:

	Ft.	In.	
	1	8	length.
		4	number of cloths.
	6	8	
	3	0	feet in the collar.
Total	9	8	

RUDDER-COAT—HOW MADE.

THE utility of this coat is to prevent the sea rushing into the ship through the rudder-hole abaft.

The coat is affixed to the rudder, and then encases the opening in the counter.

METHOD OF ADMEASUREMENT.

GIRTH the circumference of the rudder-hole ; then round the rudder and part of the stern-post about four feet below the counter. These girths give the width at top and bottom. The length is obtained by measuring the distance between the places encircled.

Divide the upper girths into an equal number of breadths, suitably to the canvas, allowing for the beams. The cloths are gored *downwards* with a small sweep, in order that the coat may bag, and not set too tight when finally fitted. The seams are one inch wide, and a two or three inch tabling is made all round.

To find the quantity of canvas in a rudder-coat, multiply the number of cloths by the length of the coat :—

EXAMPLE :

Ft.	In.	
4	9	length of the coat.
	6	number of cloths.
Total 28	6	or nine-and-a-half yards.

SHIP-BUILDING.

THE following outline of the art of ship-building has been abridged from a popular paper, which appears in the "Encyclopædia Americana." Those passages which are not in accordance with the principles and practice of British Naval Architecture, have been purposely omitted. Though inserted in this portion of the work, this article is especially intended for the perusal of the junior branches of the profession.

THE DRAUGHT.—"The nicest and most difficult operation in ship-building consists in forming the draught. This is usually effected, in Europe, by representing the form of the proposed ship in three distinct points of view. The first is called

the sheer plan, and gives a complete view of the side; here are represented the length, depth, rake of the stem and stern; the wales, water-lines, decks, ports, masts, and channels. The body-plan shews the breadth, having described upon it every timber composing the frame of the ship; those running from the place of greatest breadth forwards being described on the right hand; those running aft, on the left. Lastly, there is the half-breadth, or horizontal plan, shewing the whole as if seen from above. To construct these draughts is exceedingly intricate, and laborious; and, when finished, they convey no very clear idea of the intended ship. American builders, and some of the best British builders, have a different mode, very easy and satisfactory. They begin by making a wooden model of the proposed construction, the thing itself in miniature. Here the length, breadth, bulk, all the dimensions, and most minute inflections of the whole, are seen at a single glance; the eye of the architect considers, and re-considers, the adaptation of his model to the proposed object, dwells minutely on every part, and is thus able to correct the faults of his future ship at the mere expense of a few chips, and while yet in embryo.

"In a ship of war, the great object is speed, connected, as far as may be, with ease of movements, and capacity to accommodate her crew, and carry a large supply of water and provisions. One point, moreover, is especially to be looked to; this is, that the ship float sufficiently high above water to run no risk of receiving seas in her lower ports, in time of action. In order to be secure of this, the constructor must make an estimate of the whole weight of the ship, including body, spars, and armament, men and munitions; and must so model the bottom, that it will have displaced an equal weight of water when arrived at the depth.

Bow and Stern.—"Among the admitted and well-established principles of construction is the leading one, that the greatest breadth must always be before the centre, and, consequently, the bow be more blunt than the stern. Some of the best builders place this point only one-third of the length from the stern. Abstractly, it would seem most important that the bow should be adapted to divide the water with the least possible resistance; but, experience has proved that it is far more essential to facilitate the escape of the displaced water

along the side of the vessel; for, when once a passage is opened for the ship, the fluid tends to reunite abaft the point of greatest breadth.

"There is a further advantage in having the bow full towards the water-line,—that it may check her in descending into the waves, not abruptly, but gently,—pitching being the most dangerous, to hull and spars, of all a vessel's movements. Though sharpness towards the stern-post is vitally essential to fast sailing, yet care must be taken to leave the buttock full towards the surface,* in order to check the stern gently in descending, and, when scudding before a gale, to lift it in timely season, on the arrival of a sea. To hit the exact mean in this respect, so as not to retard the sailing, on the one hand, nor, on the other, to endanger the safety of the ship, requires all the skill of the architect. The midship-floor should be nearly flat, in order to render the ship buoyant and stable, or capable of bearing sail.

* Danish vessels are so formed. Fulness abaft contributes much towards easing a vessel at her anchors. The author served in the "Dannemark," a Danish built ship of the line. She was an admirable roadster. In the North seas she has held at her anchors when other ships of the squadron have driven and parted, or have been compelled to slip their cables.

It has been suggested, that since stability is in proportion to the length, an elongation of ships might be productive of increased speed; but, though they would thus be enabled to carry more sail without an essential increase of resistance, yet, it may well be questioned, whether this advantage would not be more than compensated by the corresponding increase of difficulty in turning, manœuvring, and rising to escape the breakings of the sea. There must, also, be a less compactness and strength, proportionate to the increase of length, so that such vessels may be only adapted to the smoothness of a lake, or to the purposes of privateers, and smugglers, who are desirous to procure rapid movements, at whatever sacrifice. An increase of breadth may produce equal advantage, without any sacrifice; for, inasmuch as stability increases as the cubes of the breadth, by adding one-quarter to the breadth, you gain a double stability, and, by consequence, a capacity to bear twice as much sail, with but one-fourth of increase in the resistance.

"Keeping these principles in view, the builder then proceeds to form the half-model of his pro-

posed ship, making it of the usual relative dimensions (a quarter of an inch to the foot). When satisfied with his performance, he takes asunder the horizontal sections of plank of which the block was originally formed, and he has before him all the water-lines in miniature. Having marked these on the floor of the moulding-loft, he has all the necessary data, and proceeds to draft the entire frame. This done, pine-moulds are formed of all the different parts, and the preparatory labours are complete. The scene now changes from the moulding-loft to the ship-yard, and the builder turns his attention to the materials.

"The timber being collected, the workmen, with each his mould, proceed to fashion the pieces of wood assigned them, a due regard being had to careful conversion, that no stick is hewn contrary to its grain so as to impair its strength, nor a larger one ever used than is necessary for the particular purpose; and, especially, that no bad, or even indifferent wood be put in an important place, whence it could be removed only with difficulty.

FRAMING.—"The frame being ready, it is thus put together. First, the blocks are placed in

the slip, and the keel laid upon them, the pieces being snugly scarfed together and bolted; the keel is also scarfed to the stem forward, and the sternpost aft, the apron being raised with the stem, and the transoms and fashion pieces with the stern, if the vessel be not large. In laying down the keel, great care must be taken to preserve its perpendicularity, for which purpose it is pinned with three nails on either side of the blocks; also in raising and propping the stem and stern, and every piece of the frame. It is only by extreme attention that the builder avoids producing a crooked ship—an artificial monster of by no means rare occurrence.

"FLOOR-TIMBERS are now let into the keel, and every other one is there firmly bolted and rivetted; they are notches of trees, formed by the trunk and one of the branches. Hence, in order to have equal strength on both sides, the butts should be alternately placed to right and left. As the floor-timbers are the great connecting principles of the ship, to which they bear the same relation as the ribs to the body, too much care cannot be taken in selecting and securing them. The

dead wood which fills up the angles at the stem and stern being got in, the kelson is laid upon the floor-timbers, which let into it, until it rests upon the keel; its pieces are scarfed together, and to the stemson and sternson, which form its prolongation up the stem and stern. A bend usually consists, besides the floor-timbers, of four futtocks and one top-timber, on each side; the first, or lower futtock, descends to the keel, besides the floor-timbers to which it is either bolted or pinned with treenails; the heel of the second rests upon the head of the floor, and bolts to the side of the first; and so on up to the top timber. Towards the stem and stern, the timbers do not meet the keel at right angles, but are inclined respectively forward and aft, as well to economize timber, by adapting the sticks to the inclination of the curves, as to augment the strength of parts much exposed to shocks from waves, rocks, and icebergs. The different portions of the frame are thus raised to their places by sheers and tackles, and then carefully shored, and kept to the proper breadth by cross pales; ribands are also carried round the frame and bolted, and every precaution taken to

confine each separate part to its particular position. The frame, being now complete; is dubbed smoothly off within and out, preparatory to planking. Sometimes the frame is made completely solid, and caulked; in this case the interior covering of plank is dispensed with, excepting a few strengthening streaks. This method has many advantages; a little additional width to the timbers brings them in contact, when, besides their being naked and exposed to the air within, there is no space for the generation of those destructive gases which cause dry rot. In this case, salting, which makes a ship damp and unwholesome, is also avoided.

PLANKING.—"Having advanced thus far in the construction, the next care is to proceed with the planking, which does not merely serve to exclude the water, but to protect, connect, and bind harmoniously together, and is quite as essential as the skin to the body. Though, apparently, the most simple part of this wonderful machine, it is yet very difficult. Just as, in draughting the frame, it is necessary to have in view all the ports and scuppers to be carried clear of the timbers, it is essential, in planking, to have a preconcerted plan of the

whole. The butts must not come near the scarfs of the keel, nor beside each other within or without, nor near the port-holes, nor opposite the pumps, lest the oakum be sucked out, but must be judiciously distributed, so as to impart equal strength to every portion. It is also one of the nicest arts of the builder, so to carry up his planking, as, with little waste, to keep his seams always fair with the water lines. When it is necessary to bend a plank at the bow or stern, it is heated by steam, and then forced into place with screws and levers. While this is going on, the beams are erected and pillared on the inside plankings; the knees, which are crotches of timber or iron, confine them to the sides; also, the transoms at the angles of the stern; in like manner, the breast-hooks hold the stem to the planking and cant timbers of the bow. All this being attended to, the decks, plank-sheer, and rails finished, pumps placed, the bits for securing the cable, the capstan, the catheads for suspending the anchors, hatchways, mast-holes, and a variety of other objects, which, though too many to enumerate, must by no means be forgotten—all being complete, the carpenter makes room for the caulker,

who carefully stops all the seams with oakum, and smears them with pitch. The scraper follows the caulker; and, water having been pumped into the hold, to ascertain whether there is any leak, the bottom is ready to be sheathed, or coppered, to protect it from the worms.

SHEATHING "consists simply in covering the bottom, with sheets of paper, soaked in hot pitch, being placed between. In sheathing with copper, paper or felt is also interposed. The plates overlap each other from bow to stern, to prevent their being stripped off by the continual shock of the passing water.

LAUNCHING.—This is the triumph of the builder. It is a nice operation, and is thus performed:—If there be no ways in the slip (which is always an inclined plane descending into the water), they are immediately prepared. Two parallel platforms of solid timber are laid, one on each side of the keel, at the distance of a few feet from it, and extending from the stem as far below the stern as can be reached at low water. In this position they are carefully and firmly blocked and supported through-

out their length. This double platform is called the ways. Upon it a second system of timber is loosely laid, and well greased between. The space from these last to the ship's bottom is every where filled with wedges of soft wood, fashioned to its curves. The whole is called the cradle. The extremities of the cradle at the bow and stern are bound tightly across the keel with chains or ropes, and it is further kept from spreading by stout mouldings, which overlap the outer edges of the ways. When the rising tide has reached well up the ways, the wedges are simultaneously driven on every side, and the ship is raised from the blocks on which she has hitherto rested, and made to repose entirely on the cradle. The shores are all removed except the two spars planted against the counters, and when the proper moment has arrived these are also knocked away. The vessel, now abandoned to her weight, and encouraged by the yielding of the grease, begins slowly falling on the inclined plane; her motion becomes at each moment more and more rapid; the ways smoke and ignite with the pressure and velocity of the moving mass, and in a twinkling the noble fabric is upon its destined element."

The limits of this work will not admit of any descriptive detail of the plans of Sir Rob. Seppings. His triangular system of connexion and diagonal framing, add considerably to the strength of vessels of war. But the greatest improvement introduced in naval architecture may be said to consist in what is technically termed the FILLING-in of the timbers.

The openings between the ribs are filled in with slips of timber nearly to the height of the orlop, or lower tier of beams; which being then caulked, and paid or pitched over, makes the frame from head to stern, and within a few feet of the greatest draught of water, one compact and water-tight mass of timber; so that were any of the outer planking of the bottom to be knocked off, the ship would not only still keep afloat, but would be secured from sinking. In the old system the starting of a plank would be, and often has been, fatal.

The mode of filling in these openings between the frame, where the width of the space does not exceed three inches, is by driving in slices of wood cut wedge-like; two of which being driven, one from the outside, the other from within, form the

parallel space of the opening, thereby bringing the parts into the closest contact. In the openings exceeding the width of three inches, the space is occupied by pieces corresponding with the openings, the fibre of such pieces being laid in the same direction as that of the frame timbers.

These fillings occasion no consumption of useful timber, as one-fourth of the produce of slab, and other offal now sold as fathom wood, would supply a sufficient quantity for the consumption of the whole navy.

"The advantages obtained by filling in* the openings are these. To add to the strength and durability of the fabric; to preserve the health of the crew from the effects of the impure air arising from the filth which soon collects in these openings; to render the ship less liable to leakage, as well as to facilitate the stoppage of any leak; and, lastly, to increase, as it may be said, the thickness of the

* His Majesty ship "Orestes" struck upon a sunken rock on the coast of Portugal. By this accident *eighteen* feet of the main-keel, from the main-mast forwards, was knocked off, close up to the "garboard streak." During a passage of eight days, to Spithead, the ship made no more water than four *inches* per hour. Had the timbers of the "Orestes" not been "*filled in*," the probability is, that the ship never would have reached a British port.

bottom from four or four-and-a-half (the usual thickness of the plank) to about sixteen inches, thereby lessening very considerably the danger to be apprehended from getting on shore, or foundering at sea. That it tends also tot he durability of the ship, will be inferred from the following positions:—

"1st. That the openings in the old principle are, after a ship has had any considerable length of service, choked up in many parts with an accumulation of filth.

"2dly. That no free circulation of air can be obtained in those openings by any means.

"3dly. That timber being either freely exposed to, or excluded from the air, is equally preserved.

"4thly. That it has been found, on examining the frame and plank of old ships, that those parts (now filled in) generally decay sooner than the rest, viz. from the floor-heads in the midships, and from the dead-wood forward and abaft to the height of the orlop clamps."

BOATSWAIN.

PRELIMINARY REMARKS.

THIS officer holds a station, in the ship, of the greatest possible utility. His vigilance should be perpetually on the alert: nothing is beyond his jurisdiction. In all the other inferior officers the duties are defined, but with the boatswain it is otherwise,—his eyes should be everywhere.

He ought, for example, to be a thorough seaman and a good rigger;* he should be active of limb, quick of sight, and ready in the exercise

* In the art of measuring, or, as it is technically termed, "Cutting Rigging," boatswains are sometimes found to be deficient.

of his mental faculties: but all these qualifications will fall short of their due effect, unless he be possessed of good temper, and be of sober habits.

GENERAL DIRECTIONS.

ALTHOUGH the boatswain is to consider himself a day-officer, he should bear in mind that, at night, he is subject to the call of the lieutenant-of-the-watch.

TURNING THE HANDS UP.

'IN turning the hands up,' or calling the crew to the performance of any particular service, boatswains too often think it necessary to indulge in piercing pipes and drawling tones of superfluous length.* Nor is the triple repetition of such pro-

* Boatswains have a singular propensity to demonstrate the soundness of their lungs, by their most endless protraction of a note on their piercing pipes. They should not be so anxious to supply the vocal deficiency of the sea-birds. This propensity, how-

tracted sounds likely to produce alacrity in the movements of the men. Upon such occasions the boatswain is recommended to confine himself to one short preparatory pipe, and to one smart commanding call.

HAILING ALOFT.

In well-regulated ships, boatswains are not permitted to encourage their wonted predilection for *hailing* aloft. The practice is invariably repressed by the officer in charge of the deck. Bluster betokens little of business, and boisterous words serve only to demonstrate the truth of the adage, "all *noise*, and *no work*."

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ever, is not the worst feature in their taste; for when, at last, they utter the required summons, they give it forth in tones so drawling, that the *first* words may be forgotten before the last are pronounced. The boatswain, to be sure, is by some considered, *ex officio*, a musical character; but it cannot be denied that he lays too much stress on his *overture*, and is moreover inconveniently addicted to what his tuneful brethren technically call "repeats." "A—l—l H—a—n—ds a—b—o—u—t S—h—i—p!" If this lengthy summons is to be preceded with a longer-winded whistle, and each pipe and phrase be three times repeated by the boatswain and his three or four *mates*, the ship may be on *shore* before the leader of the band can be convinced how dearly he has "paid for his whistle."

STANDING, AND RUNNING RIGGING.

THE boatswain will not be permitted to make the slightest alteration in the standing or running rigging without the previous sanction of the master, or the senior lieutenant. To prevent mistake, upon aught of alteration, he is recommended to consult *both* authorities.

WORKING UP JUNK—KNOTTING YARNS.

IN working-up junk the boatswain should be careful that every part of it be converted to all such purposes as may be ordered by the master or senior lieutenant. Nor are yarns to be drawn or knotted without the express permission of the latter officer.

POINTS, GASKETS, AND NIPPERS.—In addition to those in use, the boatswain should keep ready prepared for service a sufficient supply of points, gaskets, mats, plats, and particularly *nippers*.

MAKING ROPE.—He is to be attentive to the conduct of the rope-maker,—to see that he is diligent,—that the rope he makes be well turned out

of hand, and that the quantity correspond with the quantity of yarn issued for the purpose.

INSPECTIONS.

OF SAILS AND RIGGING.—The boatswain will be required to inspect every morning the bent sails, the standing and running rigging,* and report their state and condition to the officer-of-the-watch. Should repairs be needed, or new rope required to be rove, the master and senior-lieutenant are to be made acquainted with the circumstances.

OF SHIP'S CHANNELS—BOATS ON THE BOOMS AND QUARTERS.—This officer will be held responsible that the channels of the ship be kept perfectly clear, and that they be not lumbered with swabs, brooms, brushes, uncoiled towlines, or unbent buoy-ropes. He should also see that there be no lumber in the boats stowed on the booms, as well as those hoisted to the quarters.

HALF-YEARLY—OF CHAIN-CABLE.—The Official

* On these occasions the boatswain should see squared and secured the rattlings of the rigging low and aloft.

The "Naval Instructions" direct the boatswain "to take upon charge the rope that is so made."

instructions require a half-yearly survey to be held on the chain-cables. When the cables are found effective, the boatswain is cautioned to procure the "report of survey," in order that he may place it in his guard-book for the purpose of passing his annual accounts.

CLOTHES SUSPENDED ALOFT.

It not unfrequently happens, that, after the boatswain has made his report to the senior-lieutenant, or to the officer-of-the-watch, that "every thing is well and in order aloft," shirts, trousers and sometimes scrubbed hammocks are seen, from other ships, suspended before the heel of the top-mast, or in positions purposely sought to avoid the scrutinizing eye of the senior-lieutenant. Boatswains will do well to take the *hint*.

Weight of the Boats of His Majesty's Ships and Vessels of War.

Rate in Guns....		120	80	74	Razee 50	52	46	Razee Corvette 26	28	Corvette 18	Brig 18
Weight of the Boats.		Tons. Cwt.	Tons. Cwt.	Tons. Cwt.	Tons. Cwt.	Tons. Cwt.	Tons. Cwt.	Tons Cwt.	Tons. Cwt.	Tons. Cwt.	Tons. Cwt.
	Launch	5 8	5 2	5 2	5 2	4 3½	4 3½	—	—	—	—
	Cutters....	2 No. 1 3	2 No. 1 3	2 No. 1 3	2 No. 1 2	2 No. 1 3	2 No. 1 3	2 No. 1 3	0 14¾	10¾	0 10¾
	Barge	1 10	1 10	1 10	1 10	1 10	Commodore. 1 10	Cutter. 0 14½	2 Cutter Gigs. 1 6	0 8	0 8
	Pinnace	1 10	1 10	1 10	1 10	1 5¼	1 10	1 10	1 5¼	1 5¼	1 5¼
	Gig	...	...	...	0 10¾	...	...	0 9½	—	—	—
	Jolly Boat..	0 9¾	0 9¾	0 9¾	0 9½	0 9¾	0 9¾	...	0 9¾	0 7¾	0 7¾
Total weight of the Boats		10 0¾	9 14¾	9 14¾	10 4¼	8 11½	8 16¼	3 17	3 15¾	2 11¾	2 11¾

(Abridged from "*Edye's Naval Calculations.*")

FIRST COMMISSIONING.

SURVEY-BOOK—RIGGING-WARRANT.

As soon as the ship is commissioned, the boatswain should apply to the commanding-officer to procure for him the above books.—Vide "*Captain's Clerk.*"

RIGGING PARTIES.

BEFORE the boatswain proceeds with the rigging of the vessel, he should procure from the senior-lieutenant, a regular list of riggers for each department of the ship. For example, "party to clothe bowsprit"—ditto "to rig fore-mast and fore-yard"—ditto, "fore-top-mast and top-sail-yard"—ditto, "main-mast and main-yard," &c.

These parties should never be broken off, nor should they ever be employed in the *hold;* when not at work on the rigging, the services of these parties may be turned over to assist the several "gangs" employed in fitting and pointing the sails.

TRANSPORTING LOWER RIGGING FROM THE DOCK-YARD.—As soon as it be desirable to rig the lower masts, the boatswain should be cautious in removing the lower rigging from the shore to the ship, and that the shrouds for each mast be placed in the lump, or lighter, in the same order in which they will be required to go aloft—that is, stays and swifters underneath all, shrouds in pairs, according to their number, and pendants uppermost. By this arrangement, the rigging need not be removed from the lighter until ready to place over the masthead. The gauntlets are then readily overhauled into the vessel's hold, and are bent on to the shrouds as required.

The boatswain should consult the senior-lieutenant as to the time and tide for transporting the lump. The *morning* tide is always to be preferred.

PLACING LOWER-RIGGING OVER MAST-HEAD.

In some ships, the bolsters, previously to parcelling, are considerably reduced, and after the pendant and first pair of shrouds are got over, an up-and-down tackle* is hooked well up round both parts of the shrouds, and boused down in a perpendicular position, whilst the man at the mast-head beats down the eye of the rigging with a heavy commander. In placing the rigging at the mast-head, the boatswain should caution the people aloft, that the seizings of the eyes of the several shrouds are not made to ride, but that each pair of shrouds be placed in a position to insure that the seizings will gradually "quarter aft."

When the shrouds have been severally boused down in the perpendicular position, they may then be brought to the channels, and, if the dead-eyes be turned in, set up† on their proper laniards.

* The lower block of this tackle should be hooked somewhere about the bits, or bolt for the top-tackle-fall block.

† When the rigging is not turned in, some ships set it up temporarily by means of salvagees, or small-tailed dead-eyes, similar

TURNING IN DEAD-EYES.—The propriety of turning-in the dead-eye with the "end down," or, as it is generally termed, "cutter-stay-fashion," appears yet to be a disputed point, even with seamen of the first experience. Opponents to the method of turning-in with the end *down*, denounce it as detrimental to the rope,—asserting that the shortness of the '*nip*' produces chafe, and premature decay to the shroud. But instances can be cited to shew that when the dead-eye has been turned-in, in the usual way, with the *end* of the shroud *uppermost*, that the throat-seizings have "gone" and the dead-eyes have drawn. On the other hand, shrouds turned-in cutter-stay-fashion have, on the same occasions,* held on, and the rope in no way damaged by the nip. The more this method is tried the more serviceable it will be found.

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to those fitted for stoppers in action. By this means the rigging is stretched before it is finally turned in. In small ships, this plan may be readily adopted. In large ships, from the size and thickness of the shrouds, this method is not so practicable.

* It is a remarkable fact, that, in the heavy hurricane which the squadron of Sir Richard Strachan encountered in the late war, the *only* ships that did *not* snap the throat-seizings of the lower-rigging, draw dead-eyes, or carry away spars, were those that had had their rigging turned in, cutter-stay fashion.

CLOTHING BOWSPRIT.

THE boatswain should ascertain from the senior lieutenant, whether the bowsprit is to be clothed in the customary manner, or after any particular fashion. This becomes a necessary inquiry, as captains are sometimes desirous of fitting the fore-stay-collars in a manner very different from that of the established form. Some ships fit the fore-stay collars "*butt sling*" fashion, with a thimble or heart on each side of the bowsprit, and through which the spring and standing stays are to reeve. This plan has been tried in ships of all classes, and is much approved of, from the facility it affords in the operation of shifting a jib-boom. In the usual mode it is somewhat difficult to shift a jib-boom, in consequence of the heel of the spar binding in the heart of the stay-collar.*

* The method of forming the proposed collar is thus:—Make a salvagee-strap of small rope, equal to the strap of the established fore-stay collar; in one bight, seizing a heart or thimble, according to the size of the ship; the other bight lay on the top of the bowsprit, and pass the thimble part through it, from underneath up; heave it taut through, beating the bight on the bowsprit down as the other part is pulled up. When well taut and close down, clap a seizing round the bight, without the thimble. The fore-

BOB-STAYS AND BOWSPRIT-SHROUDS.—It is always desirable that the bob-stays be well parcelled and covered with leather* in the wake of the cut-water. It is also recommended to pass as little service as possible on the bowsprit-shrouds.

The spun-yarn is apt to break and separate, and as this cannot be always repaired at sea, water lodges within the service, and consequently tends to rot the rope.

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stay may then be rove through the heart or thimble, and finally set up. The spring-stay collar is fitted in a similar manner. The thimble or heart in each collar should be so placed as to lay on the upper quarter on each side of the bowsprit. The straps to be placed in the same position where the established collars are usually lashed.

* Little of leather is allowed for the purposes of stropping-blocks. To procure a ready supply of this article, it was the constant custom of a well-known first-lieutenant, celebrated for his love of leather, to adopt "ways and means" peculiarly his own. On every occasion when this officer "went his rounds" to inspect the order and condition of the different decks, it was always remarked that his manner manifested much of disappointment when he happened not to light upon a stray pair of boots; but to stumble upon a pair of "long shorts," was observed to be a source of infinite delight. No words were wasted; there was no hue-and-cry of "Lost, stolen, or strayed!"—the only sounds that fell upon the ear were, "Here, Mr. B." (meaning the boatswain,) "here's a capital haul of light leather,—*glorious hivers* for the parrels of the to'-gallant-yards."

LOWER STAYS.

SHOULD the lower-stays be fitted each with a mouse, it will be much easier to place them over the rigging, before the tops are on. When the tops are secured to the cross-trees, the stays must be rove aloft.

Lower-stays fitted with *lashing-eyes* are, for manifest reasons, best suited to vessels-of-war.—For example, the fore and main-runners may be got up, boused forward, and the eye of the standing-stays unlashed aloft, and sent down upon deck to be turned in afresh, even when the top-gallant yards are across.

TOPS AND HALF-TOPS.

MANY seamen affect to disapprove of "half-tops,"* asserting that two halves can never be so well secured as one whole. This is mere prejudice; for practical purposes, a half-top must be always preferred.

FUTTOCK STAFFS.—In marking the position in

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* Vide BOATSWAIN—"*Practical Hints.*"

which the futtock-staves are to be placed, care must be taken that on each side they be put at equal distances. The proportion for seizing the futtock-staff across the shrouds is the length of the lower part of the trestle-tree to the lower part of the hounds; this length should be marked on the aft and foremost shroud of the lower rigging. Should it, however, be required to *shorten* the futtock-shrouds, this mode of admeasurement must be proportionably reduced.

To assist the eye, and to attain the desired mark, the boatswain is recommended to place "catarpin fashion" a black batten across the shrouds, from side to side.

Futtock Shrouds.—In all vessels-of-war, the futtock-shrouds are too *long*. Ships whose lower-yards are slung high, and brace sharply up, have their futtock-shrouds considerably shorter than the established length.

Lower-lift Blocks.—Lower-lifts, in ships of any size, are best fitted with double blocks. An iron plate is now bolted across the upper side of the lower cap. The plate presents the form of a crescent. In the hollow side towards the top-mast,

in each extremity of the crescent, an eye is turned, in which a thimble is inserted. In some ships, instead of the eyes being turned, and driven through the crescent and cap, two eye-bolts are secured underneath with a nut. By this method the lift-blocks are brought well forward; consequently the lifts are not so liable to bind, chafe, or injure the foremost shroud of the top-mast rigging.

GETTING IN LOWER-YARDS.

THE boatswain should consult with the senior lieutenant whether the lower-yards are to be fitted with jeer-blocks or not. In all rates exceeding the large razee corvette, it is recommended to fit, at least, *one* jeer-block to the lower yard. In ship-sloops, and eight-and-twenty-gun frigates, jeer-blocks may be dispensed with. The jeer-block or blocks, however, should not be finally fitted to the yard before launched. A block to answer the purpose may be lashed before the yard leaves the mast-house, in order to facilitate its ascent across the gun-whale.

When the yard is launched and brought along-

side of the ship, it may be placed across the gun-whale by proceeding thus:—

Place empty casks on each side of the gang-way, or whatever will best answer the purpose, on which the yards can rest for rigging.

If a ship of the line or heavy frigate, let a hawser be rove through the outer sheave in the jeer-block aloft, then through the centre one attached to the block on the yard,—up again through the middle sheave in the block suspended from the lower mast-head. Clinch the end of the hawser round the yard, close to the block; stop the standing part of the hawser with three or four stops at equal distances along the upper yard-arm, commencing from the inner quarter. To the short mast-head pendant hook the fore and main tackles,* and have two long luffs overhauled upon each gangway, ready to bouse the yard forward, clear of the mast. When ready for heaving up, the hawser may be brought to the capstan, and as the upper yard-arm rises clear of the gun-whale, the stops are cast off.

* If the main-mast; if the fore-mast, two luffs hooked from each side of the bowsprit, and overhauled aft, ready to hook to each quarter of the fore-yard.

The main-tackles are to be hooked in time to assist in taking the weight off the hawser.

Should there be no jeer-block lashed to the yard, a top-tackle pendant-block may be substituted, and the hawser rove singly instead of doubly. This is applicable only to smaller ships.

FITTING LOWER-YARDS.

CHAIN-SLINGS are now supplied; they are preferable to those formed of rope, and supersede the necessity of slinging the lower-yards, for action. The boatswain, however, is cautioned to parcel them well over, and cover them with green hide before they are clapped round the yard.

JACK-STAYS are fitted in various ways; they are sometimes formed of iron; but the common rope jack-stay will be found to answer every possible purpose. *Two* jack-stays are sometimes fitted, and perhaps, in climates where the courses have to be constantly reefed, the *second* jack-stay were better attached to the lower yards. The jack-stays will also serve to secure the stirrups of the foot-ropes. The stirrups should never be *nailed* to the

yard. The upper eye should be placed over the neck of the bolt through which the stoutest jack-stay is intended to be rove. The jack-stay then answers as a toggle to secure the stirrup to the yard.

LOWER TRUSSES.—Lower trusses are fitted in various ways; but the regular *rollers* fitted abaft the trestle-trees have long been disused. The favourite "fashion" appears to be, to lead the truss-fall through sheave-holes cut in the after extremities of the trestle-trees.

In the war time, lower trusses were frequently rove in a manner well calculated to support the yard, in the event of the *slings* being shot away in action. A large clump-block was lashed well up on each side, within the head of the lower-rigging, as far aft as possible. Each truss-pendent was then rove through the clump-block on its respective side and brought down upon deck. The pendents were cut long, and admitted the yards to lower a considerable distance; indeed, as far as requisite without turning out the truss-blocks.

YARD-TACKLE PENDENTS.—It has long been the custom to fit the yard-tackle-pendents with a strop

round the yard, so as to hook and unhook as occasion may require. On the propriety of this practice a difference of opinion prevails; many officers asserting that the yard-tackles can be traced up and hooked with equal expedition with the stays. Perhaps so; but the author, in two instances, witnessed the loss of two valuable lives in consequence of yard-tackle pendents not having been attached to the yards. At all events, in time of war, yard-tackle pendents should be fitted to the yards. When they are not attached to the yards, they should be placed, or rather coiled, in a sort of box fitted for the purpose in the fore and main channels. They are usually stowed in the boats on the booms, but boats should not be lumbered even by the geer by which they are to be *hoisted* out.

FIDDING SPARE TOP-MASTS.

Before the top-masts which are selected to be rigged are finally fidded, the spare ones intended to be stowed on the booms should be swayed up, *tried* with their respective cross-trees, and their fids regularly entered.

In fidding top-masts, the masts are generally "*launched*" and allowed to land on their fids, totally regardless of the appearance of their *cross-trees* overhead. After the fid is entered and properly placed, the top-tackle falls should not be let go by "*the run*," but the fall eased-up handsomely by hand; the boatswain or his mate attending to the *thwartship* position of the cross-trees overhead, and to see that they are perfectly square, or, in other words, at right angles with the keel of the vessel. The captain of the top should previously attach a hand-spike to the heel of the mast, in order that it may act as a lever in moving the spar in the position the boatswain may direct. When the cross-trees are well squared, and the fid has received the weight of the mast, small wedges may be inserted in the fid hole to keep the top-mast cross-trees in their proper position. Unless top-mast cross-trees are at right angles with the vessel's keel, *top-gallant yards* never can be squared by the braces.

TOP-MAST AND BACK-STAYS.

THE boatswain should ascertain from the master, or senior lieutenant, whether the top-masts are to be

fitted with travelling back-stays, and whether those denominated breast back-stays are to be rove with runners abreast, or to be taken aft, and set up "*standing.*" The latter method appears to be much approved of, and is now becoming prevalent in the service. By this plan, the necessity of "bearing back-stays aft" is entirely avoided.

TOP-SAIL YARDS.

THE jack-stays (single), stirrups, &c. to be fitted after the manner of the lower-yards. The tye-blocks are now secured to the yards by means of iron straps; in some instances the

QUARTER-BLOCKS are also strapped with iron. This method is much to be recommended. In shifting-yards, there is no longer occasion to unreeve the top-sail clue-lines, and top-gallant sheets. When the quarter-blocks are strapped in the olden way, the above ropes, when shifting top-sail yards, of necessity require to be unrove.

TOP-SAIL LIFTS.—In large ships, the top-sail lifts are recommended to be rove double.

TOP-SAIL TYES.—Top-sail tyes are now rove sufficiently long to send the yards up and down

with; and when not wanted for that purpose, the surplus ends pertaining to the standing parts secured to the mast-head* are stopped up and down the top-mast rigging. In shifting-yards, this method will be found to save much time and trouble. The surplus end will also answer to sling the top-sail yard with, when going into action.

FITTING AND POINTING SAILS.

WHEN the weather will not permit the people to work at the rigging, or that it be deemed expedient to allow the standing rigging to remain upon the stretch, advantage should be taken of such periods to employ as many hands as possible in pointing and fitting the sails.†

* In some ships a strop and thimble are fitted under the rigging for the purpose of reeving through the standing part of the top-sail tye, which is secured, breeching-fashion, by two strong seizings, and then stopped down the foremost shroud.

† The length of the points will, of course, depend upon the size of the ship. The usual rule to determine the length of the different reefs is, to allow an increase of six inches to each reef towards the close reef. In all reefs, with the exception of the last, the *after* legs of the points are the longest. In the last, or close reef, the *fore* legs have the greatest length. The boatswain should be careful that the points be all properly whipped, crossing the turns through the whipping with a needle and twine.

Should the captain decide that the clues of the top-sails and

It is also desirable that the square sails be pointed and fitted in the sail-loft. If, however, it should so happen, that other ships' crews hold priority of place in the loft, and there be not sufficient room for all 'parties' there to work, the boatswain should suggest to the senior lieutenant the propriety of obtaining permission from the captain of the ordinary, to fit the ship's sails on board the nearest vessel out of commission.

MATS FOR LANIARDS OF LOWER RIGGING.*

THE boatswain is recommended to ascertain, as early as possible, whether there are any spare mats in store, which have been returned from ships put out of commission. It frequently happens that mats are *found* to fit with little or no alteration. Such mats can be procured on demand in lieu of

courses are to be fitted with dog-and-bitch thimbles, (a method which cannot be too strongly recommended,) application should be made to the master sail-maker to alter such sails before leaving the loft, as, when fitted upon this principle, the clues of both top-sails and courses require to be considerably shortened.

* These mats should be made sword-fashion, with shoulders and a laniard attached to the lower part, to confine them to the dead-eyes.

old junk. The time taken up in making mats is considerable; and few ships can put to sea with *proper* mats fitted for the laniards of the lower rigging.*

SETTING UP RIGGING FOR A FULL DUE.

THE boatswain should be prepared with a proper portion of "luffs" fore and aft—lower pendents, ready lashed—fore and main tackles, toggled—runners and tackles, laid along for pulling up—new laniards, ready for reeving—seizings, marling-spikes, levers, mallets, grease, &c., distributed to the several parties employed about the rigging.

If it be required to square and turn in afresh the dead-eyes of the lower rigging, two competent seamen, with their respective attendants, should be stationed to each shroud. When the dead-eyes are squared, and the mast stayed, the shrouds should be pulled up in pairs.

It is also recommended to rack the laniards of the shrouds to the inner as well as the outer parts.

* For these mats the Americans substitute a small netting, which is placed from dead-eye to dead-eye, over the laniards of the rigging; the netting is made of the same sized rope as that of which the ship's splinter-netting is usually formed.

RATTLING THE RIGGING.

THE rattling stuff should be well *stretched* before used, and the eyes of the rattlings spliced with neatness. In some ships the eyes of the rattlings are made "*artificial* fashion." *

Previously to rattling down, the boatswain is recommended to draw the "line of direction" for the inspection of the master and senior lieutenant. If the ship be in trim, it will be well to rattle the rigging by the line parallel to the vessel's sit upon the water; if the 'sit' be not ascertained, the rigging may be rattled down by the horizontal line. The usual distance for the rattlings apart, is from fifteen to sixteen inches. When it is required to rattle quickly, three ends may be taken up at a time, and the men in the rigging may begin at three different places.

TRANSPORTING ANCHORS FROM SHORE.

THE anchors should be so placed in the lump, or lighter, which is to convey them from the shore to

* Spliced with an "Artificial eye."

the ship, that there will be no difficulty in "catting," or stowing them, when brought along-side. If the ship be at moorings apart from the hulk, the starboard anchors should be stowed in the lump, on the larboard side, and *vice versa*. But if the ship be along-side of the hulk, it may be necessary to pursue the opposite course. This will entirely depend upon the ship's position along-side of the hulk, and the relative length of each vessel.

CABLES.

VIDE *Master*—" First Commissioning."

NIPPERS, STOPPERS, &c.

THE nippers, bit and deck-stoppers, and all the geer pertaining to the cables, should be made and fitted as early as possible. The superintendence of this service is assigned to the mate-of-the-main-deck.*

BLACKING THE RIGGING.

IN blacking the rigging, the first precaution that should be taken by the boatswain is, to cover, with

* Vide MATE-OF-THE-MAIN-DECK—*First Commissioning*.

old canvas or hammocks, the lower-mast-heads, and particularly the caps.

The blacking should be put on *hot*. Coal Stockholm tar, with a certain portion of salt-water, boiled together, makes an admirable mixture for blacking the rigging. It is not recommended to blacken the royal and top-gallant rigging *aloft*. This rigging may be previously blackened, and traced up to dry between the tracing posts on the deck of the hulk.

HARBOUR GASKETS.*

THESE gaskets should be platted out of hand, blackened, and traced up to dry with the top-gallant rigging. The broad part of the gasket should be made sufficiently long to secure the sail when furled with two reefs. In some ships they are made two-and-a-half inches wide. This may be a little too wide, but the broader the gasket the better the sail will appear.

Previously to clapping on the gaskets, each yard-

* Bunt gaskets are very properly "getting out of fashion." At best, they carry with them an unsightly appearance. Beckets would be found to answer every possible purpose.

arm should be divided into equal parts, according to the number* of gaskets the senior lieutenant may require to be attached to the yard. Nothing looks worse, and yet nothing more frequently offends the sight, than sails furled and secured by gaskets placed at *unequal* distances.

TOP-GALLANT-MAST ROPES.

For expedition, the mast-rope rove upon the "*bight*" with "lizards" taken through the royal-sheeve-hole, must be preferred to the old manner of fidding-masts, by the double operation of two mast-ropes, namely, the "long" and the "short." If *delay* be desired, or, in other words, people prefer going the *longest* way to work, the *short* mast-rope must be put in requisition. The mast-rope, however, rove upon the bight with lizards, is better calculated for harbour practice than for sea service. The mast-rope, which is here recommended as applicable to every purpose, may be fitted as follows:—"The rope is rove as usual,

* Gaskets are sometimes placed on the yard so as to cover every second seam of the sail: this will not be found to be a good rule. The above method is most to be recommended.

stopped to the top-gallant-mast-head and royal sheeve-hole, leaving a long end over the upper-stop, to hitch to the bolt,* before cutting the stops. To prevent the rope slipping, rack both parts together above the sheeve-hole in the sheeve of the mast."†

STOWING BOOMS.

In stowing-booms, care should be taken that the spare spars are hoisted *in board*,‡ with their extremities directed in the manner in which they are intended to be stowed on the skids. For example, main-top-mast, head *aft;* fore-top-mast, head *forward.* This practice will save much of time and trouble, in *winding* unwieldy spars, and will place the masts in the proper position for being sent aloft *upon trial.*

As soon as the manner of stowing the booms

* Lieutenant Martelli should have added the bolt in the cap.

† Martelli on "Rigging."

‡ If the spar be too long to come in board between the fore and main-rigging, the stay tackles must be hooked crosswise,—that is, the fore-stay to the heel of the fore-top-mast, and the main-stay to the head of the same stick. By this means, when the mast is raised by the yard tackles even with the gun-wale, the stays hooked in opposite ways will always clear either extremity from the fore or main rigging.

be determined, that is, whether in *one* pile, amidships, or in *two* divisions on each side of the skids, the boatswain will proceed thus :—

IF IN TWO DIVISIONS—STARBOARD-PILE—Lay the main-top-mast, (head aft,) main-top-gallant-mast, mast-fish, one yard-arm-piece, jib-boom, and main-top-mast, studding-sail-booms, &c.

LARBOARD-PILE — Fore-top-mast, (head forward,)* fore-top-gallant-mast, mast-fish, hand-mast, flying-jib-boom, and fore-top-mast studding-sail-booms.

The top-gallant-studding-booms, and small spars to fill up the different interstices, may be inserted on either side; but it is always recommended to round the stowage with spare swabs, or strands of unlaid junk.

* A distinguished officer, who is an excellent practical seaman, has, for years, stowed the fore-top-mast with the head aft. He tried the experiment of shifting the fore-top-mast, with other ships which had the heads stowed in the contrary way, and found that the frigate which had the head of the mast pointed aft, was first to complete this heavy operation. The heel of the top-mast was lifted by the "stays" over the night-heads, and boused forward by a fore-and-aft tackle from the bowsprit-cap. This method was found to be a quicker process than that of getting the heel of the mast over the gun-wale, or down the scuttle-cut in the deck of the forecastle.

Booms, to be well stowed, will occasionally require the aid of the hand-saw; indeed, the carpenter should be in attendance to take particular account, and label with paint the heel of each spar stowed in its respective pile. The latter precaution, in time of need, will save considerable trouble in seeking for the stick required.

In some ships the spare fishes are previously hollowed out to fit the fore-mast. If required for the main-mast, the gouging can be always enlarged. This method answers two purposes,—namely, a spar partly prepared to fish either lower mast, and a *bed* in which each spare top-mast can lie on the booms.

Booms amid-ships.— In stowing booms amid-ships, or on the centre of the skids, much will depend upon the vessel's form, or on the manner in which she carries her width upwards. In some ships considerable *room* is gained by the adoption of this plan. It becomes, however, a matter of nice admeasurement to place the stouter spars, especially if their extremities be found not to clear the funnel on the forecastle, or that the space which should be left open in the vicinity of the main

hatchway be at all infringed by the head or heel of either top-mast.

TOP-MAST APART FROM THE PILE.—Spare top-masts are sometimes stowed *apart* from the general pile. On its respective side, each mast is lashed independently to the skids. The mast-fishes are placed next, standing on their sides. This plan is certainly not so symmetrical in appearance as either of the other two methods; but for *ready* service, the top-masts so stowed are much sooner shifted. The boats standing on the gang-ways will necessarily (if this plan be adopted) require their respective chocks to be higher, in order to clear the bilge from the round of the mast. Officers who pursue this system of stowing spare spars invariably place the spare top-sail-yards on the skids, instead of resting them on the goose-necks fitted to the channels.

REEVING RUNNING RIGGING.

IN reeving the running rigging,* the boatswain is not recommended to *cut* and and reeve, but, on the

* It were much to be desired that the running rigging, previously to reeving, should be stretched at the capstan. The old

contrary, to *reeve* and cut. However correct the "RIGGING-WARRANT" may appear in *type*, there will be always found a difference of a few fathoms in *rope;* and it so happens that this difference invariably errs on the *wrong* side,† the allowance per *type* being sure to be *shorter* than the *measurement* per *rope.*

FORE AND MAIN BUNT-LINES.

THE bunt-lines of the courses are frequently found to jamb aloft, and, when rove on the bight and led

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practice of "taking the *end through* the coil" will, in some measure, relieve the rope of many of its kinks; but taking the mere turns out of a rope is not sufficient to facilitate its run through the block. Such ropes as top-sail-lifts, top-gallant-sheets, *after* braces, and jib and stay-sail halliards, should be all stretched before rove in their respective blocks. Moreover, if there be any time more than another that a vessel will require her ropes to run freely, it is upon the occasion of *first leaving* port, with a *raw and untrained crew.*

* Old boatswains have been often seen to heave their hats upon the deck, scratch their hoary heads, look black, and mouth and mutter to themselves, upon discovering that they had cut a running-rope several fathoms short of the desired length. Such mistakes constantly occur, from the worthy "I warrant" trusting too often to recollected lengths of "*the last ship,*" or relying too implicitly upon present returns of a printed table.

It was the constant rejoinder of a celebrated first-lieutenant, when the boatswain was wont to clinch every argument by the authority of "*the last ship*"—"Never mind the last ship. The last ship has left many a man in the *lurch.*"

forward, constantly become cable-laid. Bunt-lines will be found to lead fairer, and to haul the sails *higher* up, by fitting them after the following method:—

In the fore-part of the top, between the trestle-trees, cut two holes. Into these holes insert leaden pipes, back-stay-fall fashion. Hook to the foremost bolt on each side of the lower-cap a block, through which each buntline-leg is to be rove. Take each through the holes cut in the top, and pass them down before all to toggle to the foot of the sail. The hauling part to be led aft through lubber's hole and a block turned in at the proper distance, to allow the after leg to act the part of a pendant. Through this block a whip-purchase is rove. By this method the buntlines will be always kept clear, and they will be found, upon letting go the whips, to overhaul themselves.

In port, when the ship is moored, the buntline-blocks, with the ropes rove, may be unhooked from the bolts in the cap, and placed in the top, immediately over the holes through which the foremost legs are rove.

TACKS AND SHEETS.—The boatswain should

ascertain from the senior lieutenant, whether the captain contemplates any particular method of reeving and fitting the tacks of the courses. The tacks now supplied are tapered towards the running end; but tacks may be made to work with considerable facility by following the plan adopted by some *few* ships in the service. The method is simple, and the tacks, without unreeving, may be singled or doubled at pleasure. It is simply this: to the becket worked in the tapered end of the tack splice four or five fathoms of inch-and-a-half or two-inch rope, according to the size of the ship. This line is only to be considered in the light of a leading or overhauling line. Insert then, about two fathoms above the extremity of the standing part of the tack, a stout lignum-vitæ toggle, which is intended to prevent the standing part unreeving when cast off or disengaged from the cleat below. For example, suppose the main-sail be set with the usual double tack,—that there be light winds, and it be desirable to haul the sail up with the tack "*singled.*" At the word "Up main-sail!" the gunner's mate previously lets go the hauling part of the tack, and then immediately disengages the

standing part, which is secured to a separate cleat. In a line-of-battle ship, this method may make a difference of ten or fifteen men upon the weather clue-garnet.

Again, suppose it be required to set the sail with a single tack, the hauling part of the tack is run on board, the toggle taking the block, until a certain strain is brought upon the rope, when the standing part of the tack, which is hanging downwards, is immediately secured to its own cleat, and the shell of the block relieved from the strain which the toggle would otherwise produce.

If it be required to set the sail with a *double* tack, the gunner's mate is only to haul down on the small leading line attached to the standing part of the tack, and to take a turn or two with it round the cleat intended to secure it. By this movement the tack is doubled in a few seconds. In ships of the line, the main-sail will stand best when the sheet is led in on the main-deck.

JIB-STAY AND JIB-HALLIARDS.—For various reasons, it is advisable to dispense with the cheek-blocks, which are usually fitted to the fore-top-mast-head, for the purpose of reeving the above

two ropes, together with the fore-top-mast-stay-sail halliards.

In the first place, if the fore-top-mast be sprung, or carried away in chase, and that it be required to *shift* the mast with all possible speed, considerable time is taken up in removing and replacing the cheek-blocks at the mast-head. But independently of these reasons, the stay and halliards* should be rove under the mast-head, if only to keep them clear of the foot of the top-gallant sail.

REMOVING FROM THE HULK.

In removing the stores, cordage, &c., from the hulk to the ship, the boatswain is recommended to procure a detached party, composed of a few steady seamen,—ten or fifteen hands will suffice; and when other duties will prevent the boatswain superintending this service in person, he should delegate the execution of it to the chief boatswain's-mate. He is also enjoined to follow the system recommended to the mate-of-the-lower-deck,—namely, to

* In some ships, the jib and fore-top-stay-sail halliards are rove through *gins* fitted for the purpose. Gins, however, are not supplied to His Majesty's ships.

perform this service by degrees, commencing two or three days prior to the period appointed for the "*general shift.*" *

SHIPMENT OF SEA STORES.

With the exception of the spare messenger, stream-cable, and shroud-hawsers and cordage of this nature, it is not desirable to draw the sea-store-rope until the ship be hauled off from the hulk. Should there be no vacant buoys in the harbour, or from any other cause, the ship be compelled to remain lashed along-side of the hulk longer than customary, the boatswain is cautioned not to permit "drawn stores" to be placed in the hulk. This is double trouble, and the removal of stores to the ship is frequently attended with loss.

INDENTING.†

Upon this subject, the boatswain is referred to the article, under the same head, which will be found

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* The boatswain, of course, will remind his yeoman of the necessity of taking an inventory of each article as stowed in the store-room.

† The indents and supply accounts must be carefully examined, in order to ascertain, before the ship leaves the port, that every

in the chapter dedicated to the Carpenter, at the conclusion of the article "First Commissioning." The observations there made are equally applicable to the boatswain.

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article inserted therein has been actually received; and it is to be understood, that if any of the boats, oars, or other stores allowed for *harbour* service, be taken to *sea*, the value of the same will be charged against the warrant-officer's pay.—*Naval Instructions.*

IN PORT.

THE duties incidental to the boatswain in port will entirely depend upon the state and condition of the ship, and particularly upon the extent of the re-fit which the standing rigging may require.

Should there be any quantity of stores to return, or unrove-rope for survey, he should be careful that each article of cordage be made up in bights of five fathoms length.

DOCK-YARD DUTY.

UPON every occasion that the boatswain is employed at the dock-yard, he should previously procure from the senior lieutenant a list of the party to be sent ashore. He should also consult with the

commissioned officer commanding the division, as to the different duties which, upon landing, may be deemed desirable to be *first* undertaken.

Boatswains are sometimes astray, and often undecided as to the particular service which should *first* be put into execution; they will take two hands here and three there, and scatter the people about the yard, without apprising the midshipman or lieutenant, in charge of the party, how such hands are employed. If it be necessary to distribute the people of the party (and it is always recommended, in the performance of dock-yard service, to assign divisional duties) the boatswain should procure a list of each sub-division appointed to execute any particular task. By such system, he may visit consecutively the various lofts, and different store-houses, without seeking the officer in command, *to "give him a few hands"* for a certain service.

STOPPING UP GEER—FOOT ROPES, &c.

Of late years, it has become a prevalent practice in the service to stop in the running geer, and particularly the foot-ropes on the tops of the yards, as

soon as the sails are furled. Some officers are opposed to this practice, asserting that vessels-of-war, with geer stopped in, are not in readiness for immediate service. This, at first sight, would seem a reasonable objection; but, if it were a general rule that the rigging was only to be *stopped in* when the ship was *moored*, no inconvenience could accrue to the service in consequence of pursuing a practice which must give to every vessel-of-war a light and symmetrical appearance. Nor is it necessary to *stop* the foot-ropes *up* to the yards. Indeed, they are better when *not* so stopped, because the topmen striding the yards, when executing this service, are liable, even with the greatest care, to ride *down* the sails. Foot-ropes may be *thrown* upon the *tops* of the yards, and made to look as snug and light as if they were secured by stops.

SQUARING YARDS.

SIMPLE as may seem the process of squaring yards, it, nevertheless, may be safely asserted that, now-a-days, there are *few* boatswains to be found competent to execute this service with any degree of precision. This does not so much proceed from

obliquity of vision, as from ignorance of the principle upon which yards should be squared. The boatswain generally proceeds thus :—He first bouses taut the lower-trusses, squares the yards by the braces, and, quite regardless of the distance of the topsail-yards off their respective caps, directs the chief boatswain's mate to take his station on the jib-boom end, whilst he himself proceeds in the boat a-head of the ship, to square the yards by the lifts.

Should the fore-yard require to be topped to starboard, the boatswain will top away upon that yard-arm, until by chance he discovers that he has topped it a *little* too *high*. To remedy this eye-sore, he then sings out " Fore-yard to-port !" until he raises the larboard-yard-arm as high as that of the starboard, producing by this system of topping and never *settling*, a most unsightly *bow* in the yard. He then squares the fore-top-sail-yard by the *bowed** fore-yard, and, of course, treats the fore-top-sail-

* Possibly, there is no professional practice which tends more to disfigure a vessel-of-war than that of bowing the yards. Moreover, it is seldom indicative of *sea service*. The *bow* borders upon the guardo.

yard to a *bit of a bend.* He then takes the main-yard in hand, which, though probably perfectly square by the lifts, can no longer look so in *his eye*, because the yard-arms are not made to *cock up*, like those of the fore-yard. "Main-yard to starboard!" he sings out with an audible voice. The lift is stopped several feet to starboard, and then to port, till the yard assumes the desired *cock* the boatswain has in his eye.

In squaring the loftier yards by the lifts, boatswains seldom take the precaution of placing hands to attend the top-gallant braces. It should be remembered that the topping of the *lifts* alters and disturbs the squared position of the yard by the braces.

These may appear minute matters, but unless they be strictly observed, yards never can be properly squared.

HINTS.—Before squaring the yards, the boatswain is recommended to see that the masts, and particularly the lofty spars, are *upright* and "all in one." It frequently happens that after the boatswain has squared all the yards fore and aft, he detects an awkward inclination in one of the top-

gallant-masts; he, nevertheless, returns on board—reports to the senior lieutenant, "yards square, ropes taut;" but afterwards desires the captain of the top to "get a pull" of the starboard or larboard top-gallant breast-back-stay, forgetting that this very *pull* affects the top-gallant-lifts, and consequently alters the position of the yard.

STRIKING TOP-MASTS.

THE absence of forethought, or a little practical precaution on the part of the boatswain and petty officers, is sometimes the cause of this operation being one of no little labour. When the hands are turned-up to strike topmasts, the laniards of the after back-stays and top-mast rigging should be severally slacked, whilst the jib-stay, fore-top-mast-stay-sail, top-sail, halliards, top-sail-lifts, reef-tackles, and top-gallant-sheets, ought to be well overhauled. Steady hands should also be placed to attend the spring and the standing-stays. When blowing hard, head to wind, top-masts constantly bind in the cap, from the circumstance of letting go and overhauling too much of the stays.

Should there be any unusual strain on the top-

tackle-pendents, it were well to "stand fast" the falls for a few seconds, in order that the people aloft may examine the vicinity of the trestle-trees. The most minute rope jambed between the trestle-trees and the mast may produce sufficient strain to carry away the top-tackle-falls, if not the pendents. This precaution is more particularly directed during periods of striking top-masts in the dark. When the masts are struck, they should be kept on the right slue, and their heels securely lashed, in the event of the ship parting, or it becoming necessary to set close-reef top-sails with the mast down. The practice of sheep-shanking back-stays is not recommended. The back-stays may be set up through the medium of good luff-tackles, and by such means the mast may be rendered sufficiently secured to support the strain and pressure of a close-reefed top-sail.*

SWAYING UP TOP-MASTS.

In performing this heavy operation, every care should be taken to overhaul well, and to see that

* An interesting statement connected with this subject is appended at the end of the chapter, p. 287.

such of the standing and running rigging is perfectly clear which are calculated to impede the ascent of the masts. The topsail-lifts, topsail-tyes, reef-tackles, and jib and stay-sail halliards should be well overhauled alow and aloft, and the laniards of the top-mast rigging and back-stays be got ready for setting up the moment the mast is fidded and stayed. The forecastle-men forward should have "luffs" led along the bowsprit, and tackles up and down the fore-mast, ready for staying the fore and main-top-mast.

No top-mast should be fidded by a single top-tackle pendent. It is true that small vessels* are not allowed a second pendent, but such ships should reeve a hawser through the dead sheeve, for the purpose of acting the part of preventor in the event of the top-tackle-fall "parting."

The same precaution should be taken with respect to the position of the cross-trees *overhead* as

* Such ships should be prepared with stoppers fitted with two tails and a toggle, so as to clap on the top-tackle pendent about a foot *abaft* and *under* the top-block hooked to the cap. Top-masts ascend comparatively easy until the fid-hole becomes within six inches of the trestle-trees; then the heavy strain is brought upon the pendents, and particularly on the falls.

has been already mentioned under the head of "*Fidding Top-masts.*"

CLEARING HAWSE.

CLEARING hawse can seldom be attempted when the ship is riding by the "*clearing cable.*" But should circumstances render it necessary to attempt the operation at such a period, care must be taken that, by means of the fish-hook, the cables be lifted well out of the water, in order that they may be securely lashed, and that a strong hawser be bent *below* the lashing to the riding cable. This precaution is intended to act as a preventer in the event of the lashing "giving." The hawser should be previously boused well taut, and secured before the cable be unbitted and boused through the hawse holes, by means of the bowlines.

UNMOORING.

IT frequently occurs, in unmooring vessels-of-war, that the veering-cable is not sufficiently veered. In weighing the first anchor a considerable strain has been felt at the capstan, in consequence of the

ship not being permitted to bring the cable up and down. It is recommended "to veer three or four fathoms after the cable is *said* to be up and down. This can do no harm; it will put the whole strain of the ship on the anchor that is weighing, and thereby materially facilitate tripping it."

HOISTING IN BOATS.

THE origin of sprung lower-yards, or rather of *lower* yards '*found sprung*,' may be frequently traced, as a professional writer remarks, "to the hoisting in and out of the launch." But perhaps this accident more often occurs in hoisting *out*, than *in*, the boat, in consequence of the sudden jerk which invariably attends the letting go of the yard-tackles when the boat reaches the water. In large ships, after bousing the fore and main trusses well taut, the lower-yards should be topped up to a small angle, and the lifts, top-sail-sheets, and burtons, all brought to bear an equal strain. The runners should be used as the principal purchases, the fore and main tackles employed as auxiliaries. Much time and trouble will be saved in clearing the fore-

top-mast back-stays if the fore-brace on the same side be well rounded in. Should, however, the length of the boat prevent her clearing the top-mast back-stays, hands should be previously placed to cast off their lanyards during the period of securing the yards. Some officers affect to laugh at these precautions, but they will not laugh when the lower-yards are "*found sprung*" upon a *lee shore*.

The following account is explanatory of the novel method employed in extricating His Majesty's ship "Magnificent" from an extremely perilous position, situated in the midst of rocks, with yards and top-masts struck, and on a lee shore of the enemy, on the 17th December, 1812:—

On the evening of the 16th of December, 1812, the "Magnificent," of seventy-four guns, being one of a squadron under the orders of Rear-Admiral Sir Philip Durham, was by that officer directed to take up a position and anchor between Chasseron and Isle of Rhe, in the neighbourhood of "Basque Roads." Previously to furling the sails, the sky being dark and cloudy, a reef was taken in the courses, and the top-sails were close-reefed. At $8^h 30^m$, the wind increasing,

the top-gallant-yards were got down upon deck. At $8^h\ 50^m$, "cable was veered" to a cable-and-a-half on the best bower-anchor, by which the ship was riding in sixteen fathoms water. At $9^h\ 40^m$, it was discovered that the anchor had *broken;* the small bower was, therefore, let go, which brought the ship up in ten fathoms water. The yards and top-mast were immediately struck. The wind from S.W. continued to increase, accompanied by rain. The night was dark, but the lumination from the heavy *sea*, breaking on the Isle-of-Rhe reef (the length only of two cables from the ship), was sufficient to afford an awful view of her dangerous position. The best bower was now unspliced, and the inner cable bent to the spare anchor. The slack of the best bower was then hove in to about two-thirds of a cable, when the anchor or its stock, entangled by the rocks, assisted in holding the ship; it was, therefore, bitted and secured. The ship was now riding by the best and small bower anchors, with two-thirds of a cable on the former, and a cable-and-a-half on the latter, while the sheet, and spare anchors at the bows, were perfectly ready to let go at the shortest notice. A steady leadsman was placed in the larboard chains to a get a cast of the lead every five minutes, and a careful quarter-master stood at the starboard gangway attending the deep-sea lead. The man in the chains soon discovered a large rock, rising three fathoms from the bottom, directly under him; and others were afterwards found, by the lead striking upon them, varying in height from one to two-and-a-half fathoms. This, situated as the ship was, so *near* to the reef, and *without* chain-cables, was a terrible discovery; for in

such a position, the hempen-cables could not possibly hold her many hours longer, more particularly as the rocks caused a most irregular cross sea, giving to the ship a violent jerking motion; so much so, that the oars were occasionally jerked out of the barge on the booms.

When every preparation had been made,—the officers and men in their respective stations, ready to act on the shortest notice,—the captain (Hays) placed himself in a chair at the larboard gangway, to watch the heaving of the hand lead. The intense anxiety kept up by the soundings, varying from one to three fathoms, may be imagined, but cannot be described. The gale, accompanied by rain, continued with unabated force, and the heavy sea breaking upon the reef astern produced frightful flashes, which, in the darkness of the night, rolling over the rocks, might have been likened to moving masses of liquid fire.

The day had scarcely dawned, when the quarter-master, attending to the deep-sea lead, declared the ship to be driving. The spare anchor was instantly let go, which providentially brought her up again; nevertheless, it was but too certain that the ship could not be held much longer by cables which had been chafing so many hours on sharp and rugged rocks. The wind was now at West. St. Marie Church, on Isle Rhe, bore East. The gale increased; but the favourable change in the wind was counterpoised by a strong lee current, and a heavy cross-sea on the off-shore bow. The sun had already reached the meridian, unaccompanied by any indication of a favourable change in the weather; and the captain, feeling it impossible to sustain through

another long night the intense anxiety of that of the preceding, thus addressed the French pilot:—"Pilot, can you save the ship?" "*By gare, no!*" was the desponding reply of the foreigner. Orders were then given to sway up the lower-yards to three-fourths of their *usual height*—to secure the top-mast close down, leaving the top-sail-yards to work in the caps—to pass the largest hawser through the starboard quarter port, and to bend it to the cable on the spare anchor, for the purpose of acting as a spring in canting the ship to port, previously to cutting the cables; but, at the instant of bending the hawser, the cable *parted*, and it was ultimately bent to the small bower cable.

The courses and top-sails were secured in three or four places, on their respective yards, with stops of spun-yarn, so as to be cut on the instant; the gaskets had been previously cast off; the head and main-yards were braced-up for the starboard tack, and the other yards kept square, dividing the men (who would otherwise have been required at the braces) between the fore tack, and fore and fore-top-sail-sheets.

It will be seen, that in the event of the spring casting the ship, the head-yards would require no alteration, and it would only be necessary to guard against setting their sails *too soon*. On the other hand, if the spring (which was every way probable) broke, the yards could not be better placed for producing the stern-board, which would, in that case, be necessary to clear the reef.

Whilst preparations were being made on board of the ship, the enemy was not idle on the land, but busily occupied in placing a number of horses and

carts along the coast, to carry off all that might prove worth taking from the *expected* wreck.

The captain now saw the necessity of making an appeal to the ship's company, and thus addressed the anxious crew :—

" My men, you must, by this time, be sensible that our situation is one which calls for the utmost exertions of all ; it is, in fact, one of *life or death.* The orders you are about to receive of me are *new,* and may, perhaps, appear *extraordinary.* You must, nevertheless, execute them on the instant, without a moment's hesitation ; in which case, I trust in God, I may be able to bring the ship into a safe position in a few minutes after the cables are cut. On the other hand, should you unfortunately *hesitate,* or become unsteady, and keep fast sails ordered to be let fall, or let fall those directed to be kept fast, or, in short, not exert yourselves to the utmost in the execution of the orders you will receive, *life* cannot be ours beyond five minutes."

After this address, the spring was hove in to a tolerable strain. The master was directed to attend at the bits, and see that the carpenters cut the cables the instant the word was given. All being ready, and the greater number of those on board being in the expectation of a watery grave, the cables were cut. The heavy sea on the larboard-bow acting against the spring, caused it to snap; it was immediately cut by the axe, provided for that purpose, to prevent retarding the ship's stern-way ; the helm was put hard to starboard—the fore-stay-sail hoisted—the fore-top-sail let fall, and sheeted home—the fore-sail let fall—the tack hauled on board, and the sheet roused aft. All the sail

was flat aback, and *set in less than half a minute.* The ship's head paid round quickly towards the reef. When the wind became abaft the beam, the mizen-top-sail was let fall and sheeted home, and the helm shifted. When the wind came right aft, the main-top-sail was let fall, and sheeted home; the main-sail was next loosed, the tack hauled on board, the sheet roused aft, and the mizen-top-sail, cross-jack, and main-top-sail-yards braced up for the starboard tack. This canvas being set on the vessel, the captain exclaimed, "*The ship's saved!*"

This manœuvre, from the cutting of the spring till the requisite sails were set, did not exceed *two minutes.* At the moment that the ship's head was in the direc- of the rocks, and then only in five fathoms water, the vessel made a desperate plunge, and in hauling to the wind the send of the sea did not leave, by the soundings, more than a single foot of water under the keel.

The ship was shortly afterwards safely anchored in Basque Roads.

AT SEA.

INSPECTIONS.

MORNING.—The boatswain will be required to inspect every morning, as early as possible, the state and condition of the sails, and of the standing and running rigging; and to report the result of his examination to the officer of the morning watch. He should be particularly careful to see that the rattlings of the rigging are properly secured, that the top-sail-sheets-service is not chafed, and that all the quarter and paunch-mats are properly placed.

EVENING.—The boatswain should inspect at evening quarters all the rigging-stoppers and ne-

cessary geer required upon the occasion of clearing for action, so that in the event of being surprised by an enemy at night, such geer may be placed at hand, ready for immediate use. He should also see that the toggles fitted to the lower and top-sail-braces be securely seized to their respective parts.

INSPECTION OF BOATS.—Every evening, after sun-set, the boatswain will be required to inspect the boats on the booms, to see that they be perfectly clear, and that their slings be severally hooked, in readiness for hoisting out.

In tropical climates, it is strongly recommended to uncover the boats after the sun has set, in order that they may benefit by the dew and air. Each cover should be made up and placed in the bow of the boat.

INSPECTION OF STOWED ANCHORS.—In boisterous weather, and particularly if the ship be labouring or lurching heavily, the boatswain should inspect the several anchors, and see that they be securely stowed. In small vessels, whose anchors in a heavy sea are constantly buried under water, it is neces-

sary to take the precaution of passing "preventer" stock and shank-lashings.

The quarter-boats should also be inspected, and the boatswain should report to the officer-of-the-watch the result of such inspection.

PERIODICAL INSPECTION OF SPARE SAILS.—It is highly essential to the preservation of the sails that those stowed in the *sail room* be occasionally inspected. Independently of the damage to which sails are subject by leaks and vermin, it is necessary that they be frequently brought upon deck, opened, and exposed to the air. This precaution is too seldom observed in His Majesty's service. The clearing of, and re-stowing, the sail room is too frequently regarded in the light of a troublesome task.

SETTING UP THE RIGGING.—Whenever it is required to set up the lower-rigging at sea, the top-mast-shrouds should be all let go. This practice is recommended upon the presumption that the lower-rigging will not be cast loose or set up on the occasion of a swell, or that the ship be rolling or pitching. It has been well observed, that by only letting go two top-mast-shrouds at a time,

an uneven strain has been brought upon the futtock-staves, which prevents the shrouds of the lower-rigging being equally drawn down.

Upon all occasions of setting-up the lower-rigging at sea, it is always advisable to have ready prepared as many "luffs" as possible, so that two shrouds may be set up at a time, and that there may be no delay in shifting the tackles from shroud to shroud.

When the lower-rigging is up, the futtock-plates should be beaten close down to the top, and the shrouds set tautly up by means of tackles ready hooked to their respective laniards. The method of employing the Spanish windlass, for the purpose of setting-up these shrouds, is not to be recommended: it occupies too much time, and often creates unnecessary delay before top-mast rigging can be set up.

In staying the top-mast, the boatswain is not recommended to bouse too far forward the heads of the masts; and he should recollect that the angle formed by the main-top-mast-stay with the fore-top is considerably greater than that of the fore-top-mast with the bowsprit, and, consequently,

that the lever of the former is more powerful, and less to be acted on by the back-stays than that of the latter.

PREVENTER BRACES.

When the top-sails are *treble reefed*, the preventer-braces should be "clapped upon" the yards. —Vide *Officer-of-the-Watch.*

REEFING COURSES.

To execute this service with security, as well as celerity, the reef-earings should be formed of rope sufficiently strong to bear being boused *out* by the boom-jiggers. By this method, the inner turns of smaller rope may be passed with facility. The outer earing should be led through a block, or cheek, fitted for the purpose. This earing, it must be remembered, is not to be considered as a substitute for the reef-pendent. It should be also hooked, and hauled out by a separate tackle.

REEF-LINES TO THE TOP-SAILS.

Few ships in the service have their top-sails fitted with these *lines.* In some ships they are attached

to the points of the outer suit of sails. In reefing topsails, when blowing fresh, and particularly when steering a course, or going large, reef-lines assist materially to spill the sail, and to enable the men on the yards to get hold of the points, which are difficult to reach when the canvas is bellying to the breeze.

Reef-lines are thus fitted:—Take a piece of small rope, splice one end into an eyelet-hole in the head of the sail, seize it round the neck of one of the first reef-points on the fore side of the sail, in a straight line with the eyelet-hole, leaving enough slack to prevent the sail girting; then seize it to the under in the *second*, then the third reef; splice an eye in the end, and seize it to the neck of a *close*-reef point. In large ships there should be three reef-lines on each yard-arm; in small vessels, two will suffice.*

SLACKING THE JIB-STAY IN BAD WEATHER.

"THE jib-stay is always set up like a harp-string; consequently, when it comes on to blow, both the

* Hauling on the lines.

spray of the sea and the rain tend to tauten it more. In pitching too, it must assist to spring the boom, work the bowsprit, and cause unnecessary strain upon the rope itself. Whenever it blows so fresh that the jib is not likely to be set, the jib-stay should be slacked.

"If it be required, subsequently, to set the sail, nothing can be easier than to set the stay up when the jib is loosing." *

TOP-GALLANT-MAST STRUCK.

When top-gallant-masts are struck, care should be taken that a small mat be placed between the top-mast and the heel of the top-gallant-mast. Proper heel-lashings should also be fitted for the purpose of securing the heel of the latter.

CLEARING FOR ACTION.

The boatswain should see that the rigging-stoppers be placed on the poop, quarter-deck, and fore-castle, abreast of their respective shrouds,—that the top-sail-sheets be severally stoppered,—the top-

* "Observations on Seamanship."

sail-yards securely slung, and that preventer-braces be attached to the lower and top-sail-yards.

Should time permit of the precaution, the fore and main runners, fore and main tackles, and a proper proportion of stout luffs, should be bighted on the booms ready at hand, and whips ready rove to whip the runners up to their respective pendents. The mast-head pendents should be previously lashed abaft the mast. For the purpose of expedition (and on these occasions, as every second of time that can be saved is of the first moment) it is strongly recommended to fit the runners with stout salvagees and toggles. Compared to lashing, the method of toggling the runners becomes a mere momentary operation.

Some ships, previously to going into action, have lashed their runners, taken them forward, and set them up, and have also boused up their fore and main tackles on each side. The propriety of this practice becomes a matter of question, inasmuch as the runners and tackles are more likely to be shot away when aloft than when lying *low* bighted along upon the booms.

The boom-covers should also be taken off, and

all the minor lashings of the spare spars cast off. It may be necessary, even in the middle of an action, to have recourse to a spare spar to lash up and down a lower-mast.*

A coil of stretched rope and a ball of spun yarn should be sent aloft and placed in each top.

PREPARATIONS FOR ENTERING PORT.

HINTS. — Official Papers — Make out Present-use demands—Remains of Stores—Demands to complete—Ditto, application for Survey, &c.

ROPES TO BE ROVE.—Long mast ropes, and top-tackle pendents. These only during the winter season.

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* It is said that the pirate, Paul Jones, perceiving the main-mast of his ship totter in the middle of a severely contested action, whipt the spare jib-boom up and down the mast, converting it into a fish, and securing the two spars together by means of long nippers passed on the bight, and hove taut by hand-spikes, Spanish windlass fashion.

PRACTICAL HINTS.

TO SHIFT A BOWSPRIT BY THE SPARS OF THE SHIP.

A VARIETY of opinions prevail as to the most secure and practicable mode of shifting a bowsprit; many officers prefer the plan of converting the fore-yard into the form of a derrick. Doubtless this process is pursued upon the principle of saving time and trouble, but experience will teach the admirers of this method that the practice is founded in error. To form a derrick of the fore-yard, it becomes necessary to dip the under yard-arm *within* the lower rigging, an operation in itself attended with no little trouble. Moreover, to

obtain a sufficient length of derrick to get in or out a battle-ship's bowsprit, it will be requisite to lash the *yard* to the mast, in a position approaching the under extremity of the yard, which cannot be deemed of sufficient *strength* to bear the strain* produced by the weight of the bowsprit. The bowsprit of a brig or of a ship-sloop may be shifted by means of the fore-yard; but for a frigate, or ship of the line, it is recommended to have recourse to either of the following methods:—

DERRICK FORMED OF FORE-TOP-MAST.—As the fore-top-mast should always be *struck* preparatory to shifting a bowsprit, a secure and serviceable derrick may be formed of this spar, after the following method:—Lash a top-block close above the hounds of the top-mast; through this block reeve a stout hawser, securing the stand-

* An intelligent officer, and one of the first seamen in His Majesty's service, thus writes to the author:—"I decidedly agree with you; the fore-yard should never be used for the purpose of shifting the bowsprit. Experience supports this opinion, as I have, on board of two large frigates, witnessed the springing of the fore-yard of each ship in attempting the operation. In the second instance, (in 1813,) the accident delayed for several days the sailing from the Brazils of a convoy consisting of 300 sail. Need I say *more?*"

ing part to the fore-mast-head, and reeving the running part through another block lashed to the lower mast-head. This hawser is intended to act as a top-and-lift, by which the derrick may be raised or depressed according to the *angle* required for lifting the bowsprit clear of the bows of the ship. When the upper purchase-blocks are lashed to the top-mast-head, the *heel* of the derrick secured below, and its *angular* position obtained, the *messenger*, which should previously be taken up abaft the fore-mast, and passed over *through* the vacant hole in the fore-cap to the top-mast-head, must be housed well taut upon deck. The messenger should be passed through a large heart or thimble, so as to act as a fair leader in taking the strain off the top-mast-head, and throwing it more upon the head of the lower-mast. Perhaps employing the messenger, upon the same principle that a top-tackle-pendent is rove through the lower-yard for getting in the lower-deck guns, will be found to answer best. In this case, the voyol-block may be lashed to the hounds of the top-mast, so as to take the messenger, and act the part of the fair leader. The main purchase is

then lashed to the eye of the messenger. But it will be always safest to lash the purchase to the *head* of this spar.

SHEERS FORMED BY TWO TOP-MASTS.—This method, though perhaps causing a little more trouble, in consequence of having to clear the step of the bowsprit of *two* sticks instead of one, will nevertheless, in large ships, be found to be the safest mode of shifting so heavy a spar as that of a bowsprit of a ship of the line.

To rig the sheers, proceed thus:—take the fore and main-top-masts, and lash together their heads aloft. Upon each mast-head lash a top-block, through which reeve two stout hawsers, to answer the purpose of top-and-lifts, led double to the lower mast head. Take the messenger (as in the preceding method) through the top-mast-hole in the lower-cap, and secure it to the sheer's-head. The heel of each top-mast should be previously placed on "strong backs," or stout pieces of plank, each of which should rest, if possible, on the beams of the forecastle-deck. The beams underneath should be well shored up on the different decks. As soon as the sheers are drooped to the required angle, the

heel of each top-mast should be well secured by stout lashings passed between two ports, or round the timber-heads in the bulwarks of the forecastle; the messenger and top-and-lifts to be well secured upon deck. The main-purchase-block, in this instance, is to be lashed by a stout lashing to the sheer's head.

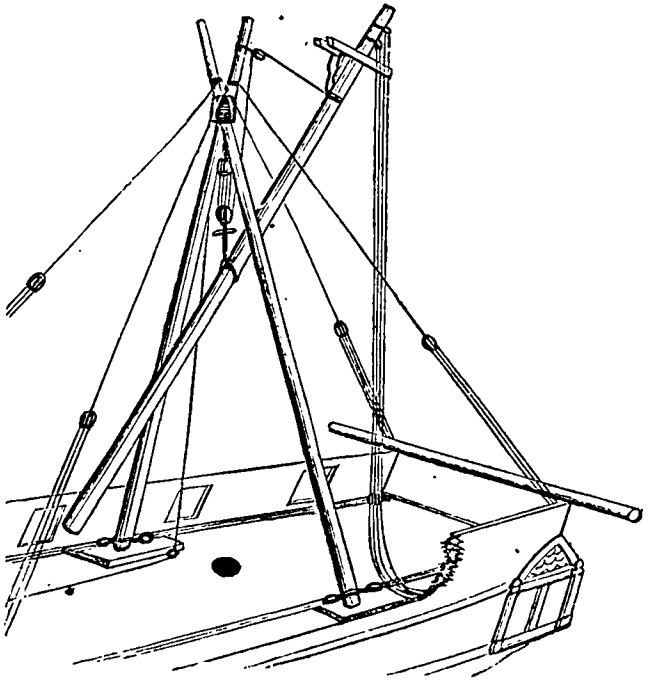
CAUTION.—In getting in the bowsprit, care must be taken that the main-purchase be overhauled down *abaft* the bumpkin; for should the purchase fall be passed before and *under* the bumpkin, it would be impossible to lift the bowsprit *higher*. The spar must necessarily be lowered again into the water; the purchase untoggled and shifted abaft the bumpkin, and, in fact, all the work must be done over again.*

RAISING SHEERS FOR LOWER-MASTS.

IT sometimes happens that a vessel-of-war upon a foreign station, is compelled to "raise sheers"

* This double trouble, through the obstinacy of a *directing* party, occurred some few years since, on board a frigate moored in Plymouth sound. The principal *director* was fully warned of the impossibility of his mode of proceeding, but, considering *suggestion* synonymous with *dictation*, he thought proper to persist in error until error left him in the lurch.

RAISING THE MIZEN-MAST BY MEANS OF SHEERS ERECTED ON BOARD THE SHIP.



from the deck of the ship, for the purpose of getting in her lower-masts.

As soon as the spars have been got in upon deck, (whether par-buckled in board, or lifted by means of the cat-fall, or tackles from the boat's davits,) they should be placed with their heads aft, resting upon a stout spar laid across the gunwale.*

The carpenter should prepare the requisite "shoes" on which the heels of the sheers are to rest, and holes should be bored in each shoe in order to attach the tail of a tackle-purchase to shift them as required. The different decks should be shored up immediately under the position in which the shoes are made to stand. The sheer's-head should be lashed by three-and-a-half-inch rope, passing eleven, and never less than nine turns. The purchase-blocks should then be lashed round all, beginning with the lower block, or rather that pertaining to the *main purchase*. The upper or lesser purchase-block to be lashed last, and above the lashing of the principal purchase. Gauntlets, rove through tail-blocks, should be attached to the sheer's-head, and two stout hawsers, each middled,

* Vide Sketch.

and clove-hitched round the head of each spar; one of these sheer-head guys to be taken forward and aft upon each side. About the centre of each spar, lash two single blocks, one to be placed on the fore, and the other on the after part of each spar. Through these blocks reeve a separate hawser, which will serve the purpose of belly-guys, and which, like the sheer-head guys, are to be taken forward and aft on their respective sides. Four deck-tackles and large luffs are then prepared for the purpose of heel-tackles, two forward, and two aft, on each side of the ship.

Raising the Sheers.—If the mizen-mast* be the first mast to be hove in, the heels of the sheers, after placing them in their respective shoes in the position desired on the deck, are to be securely lashed. Overhaul then the main-purchase as far forward as the fore-bits; to the bits lash the lower block of the main-purchase, and, in the same vicinity, secure a leading block, through which the main-purchase fall is to reeve and lead aft. Bring then the fall to the capstan, and heave round,

* Whatever mast has to be hove in, the heels of the sheers must be lashed, and the shoes and shores secured as above.

hands at the same time attending the fore-and-aft guys, and looking out for the heel-lashings of the sheers, as the angle they form with the purchase gradually increases, and the spars approach to the desired perpendicular position. When the sheers are erect, the mast-head and belly-guys are to be boused well taut, the main-purchase cast off from the fore-bits, and rounded aft, retaining sufficient length to reach the mizen-mast floating alongside.

CAUTION.—Care must be taken that the sheers be placed *before* the hole for the mast, when the mizen-mast is to be first* taken in. The same precaution is also to be observed when placing the position of the spars for the main-mast. The position in which the sheers should stand for the fore-mast is the reverse; in other words, the sheers should stand *abaft* the hole in the deck.

GAMMONING THE BOWSPRIT.

IT sometimes becomes necessary to gammon the bowsprit by the means of purchases led and worked

* This is to admit the sheers to be "walked forward;" were they to stand abaft the main-mast, or even the mizen-mast, they could not be brought forward to clear the stick standing in the step.

on board the vessel.* When this is the case, the method pursued is as follows:—

Tar well the saddle of the bowsprit, also the hole in the cut-water, through which the gammoning-turns are to pass. Take a well-stretched, or rather a half-worn rope, suited to the vessel's size; pass the end over the bowsprit, and clinch it to its own part, reeving it then through the cut-water, and passing it over the bowsprit. Attach a stout strop to one of the bob-stay-holes in the cut-water; to this strop hook a snatch block, of sufficient size to take the gammoning. Lay along the main, middle, or lower deck a stout luff or deck-tackle; hook the after block to a ring-bolt in the vicinity of the capstan, passing three turns of the fall round the whelps; snatch the gammoning into the snatch-block, hooked to the stern; pass it through the hawse-hole and toggle it to the foremost block of the deck-tackle led to the capstan.

Sometimes, and with much propriety, a pendent is sent from in-board, through the hawse-hole, and toggled to the gammoning without. This method

* Bowsprits of ships of the line are secured by two gammonings, all other ships by one.

obviates the necessity of passing the gammoning through the hawse-hole every time a turn is taken.

When the gammoning is regularly hooked, or toggled to the deck-tackle, heave round the capstan with a steady step. When well taut, wedge the turn of the gammoning in the cut-water, racking* it immediately with stout spun-yarn to its next part; walk back the purchase, untoggle and pass the next turn over the bowsprit, and *inside* the turn already passed; snatch again the gammoning, toggle, heave round again, and so continue until sufficient turns† are passed to complete the outer gammoning. A half hitch is taken with the end round all; heave well taut, pass several turns, seizing them severally to the next part. These are called the frapping turns.

EXPECTATION OF LOSING LOWER-MAST.

SHOULD a lower-mast be badly sprung, wounded in action, or there be any other reason to appre-

* The rackings should not be passed on those parts of the rope which have been greased; nor should the rackings be allowed to remain on after the bowsprit has been gammoned. By taking them off, the turns render alike, and an equal strain is brought upon each.

† The foremost turns on the bowsprit form the aftermost in the cut-water.

hend its falling over the side, a *hawser* should be rove *through* the laniards of the lower-rigging on each side, and brought in-board and thoroughly secured. If the sprung spar be the main-mast, the hawser should be taken out of the foremost part of the quarter-deck, and brought in through one of the aftermost in the vicinity of the after-swifters. By this precaution, should the spar fall over either side, the laniards may be immediately disengaged from the channels. If this precaution be not taken, when the mast goes over the side, the outer-batten or ledge which confines the chain plates will be torn off, when the batten falling in the water will preclude the possibility, in that position, of cutting or disengaging the laniards of the rigging. It is of the first moment to disengage the rigging from the wreck, as the thumping of the latter against the counter, stern-post, or rudder, may cause irreparable damage,—possibly the *loss* of the rudder.

TOP-MAST CARRIED AWAY.

If it be blowing hard, and there be a heavy sea running, the first consideration should be to relieve the *head* of the lower-mast from the weight of the

wreck. No time should be lost in hooking the two top-tackle blocks, and reeving on each side a hawser through each block; the stoutest hawser to be rove through the *lee*-block, and passed round the body of the wreck, in order to get the rigging of it in board;* whilst the weather-hawser should be employed to unfid the stump, and send it down upon deck. To disentangle the rigging of the wreck, the laniards of the lee as well as the weather top-mast shrouds should be severally cut, previously securing the dead-eyes on each side of the rigging by a pair of top-mast studding-sail halliards. The fore and main tackles should be instantly got up and lashed to their respective pendants for the purpose of being hooked to the wreck, and to

* In the French service, the wreck and rigging are immediately cut away, their ships being invariably supplied with spare "gangs" of top-mast rigging, ready fitted for each mast. Upon the occasion of a British naval officer canvassing the propriety of this practice, with a captain in the French service, who professed to be perfectly conversant with the *power* of English proverbs, the Frenchman thus concluded his argument:—"De fact is, we have not de notion to lose de *shipe* for de penny-vorth of de *peech*,"—Anglice, no notion "to lose the sheep for the ha'p'orth of tar." But the drift of the foreigner's application of the proverb was simply this:—as the French were wont in the war to be the retreating party, the practice of "expending" the *spar* and rigging was deemed preferable to the chance of capture.

assist in taking the strain off the hawser led through the lee-top block. If the main-top-mast be over the side, the lee fore-top-sail halliards, unhooked from the bolt in the fore-channels, and overhauled aft, will be found a ready auxiliary purchase in lifting in-board the wreck, or rigging.

JIB-BOOM CARRIED AWAY.

SHOULD the jib-boom be carried away, whether the accident be caused from press of sail or the pitching of the ship, the fore-top-gallant-yard and mast should be immediately *struck*. The fore-stay-sail-halliards, if rove—if not, those of the fore-top-mast stay-sail—should be instantly unbent from the head of the sail, and be secured timber-hitch fashion round that part of the wreck nearest at hand. When made fast to the wreck, the stay-sail halliards should be set well taut, and the jib-sheets at the same time brought amid-ships on the deck, and hauled well in upon the forecastle.

The lee fore-buntline,* untoggled from the foot of the sail, will be found to answer as a ready-rove

* In addition to the lee fore-buntline, the running part of the fore bowline will also serve as a ready-rove whip to assist in raising the wreck.

whip to assist in lifting the wreck from beneath the bows. The jib-stay should be immediately disengaged from the sail; the traveller secured, and stopped at the bowsprit-cap, ready to put over the new boom when pointed; and the jib, if not split, should be hauled aft upon the quarter-deck, and made up afresh, ready for re-bending. If the luff of the sail be fitted with a lacing, the several stops should be examined before the sail is made up. Should the jib be split, no time should be lost in getting the spare sail up from the sail-room. Whilst the forecastle men of the watch upon deck are occupied on the bowsprit, clearing the wreck, the fore and main-top-men of the same watch may be casting adrift the spars on the skids, and preparing the spare boom for pointing. The inner and outer parts of the broken boom should be brought inboard on the opposite side to that from which the spare spar is taken.

When the new-boom is out, and the heel-rope well secured, the boatswain should be cautious that the martingale, guys, and back-ropes be severally well set up, and that the *standing* guys on either side are brought to bear an *equal* strain.

Whilst reeving the stay through the lacings of the jib, the fore-top-gallant-mast may be fidded,* and the yard crossed.

PARREL OF A TOP-SAIL YARD CARRIED AWAY.

Top-masts, before now, have been known to go over the side, in consequence of the parrel of the top-sail yard suddenly giving way. Even with the top-sail close reefed, the *going* of the parrel has been the cause of losing the mast. When the parrel goes while blowing hard, the whole weight of the yard and sail is immediately brought upon the top-sail lifts, and the probability is, that, with the first heavy lurch, the top-mast goes over the side.* The moment it is discovered that the parrel is carried away, the yard should be instantly clued down, the weather-brace well rounded in, and a pair of stout

* When serving as lieutenant in an eight-and-thirty-gun frigate, the author witnessed a similar case. In consequence of the parrel of the main-top-sail-yard going, with a close-reefed sail set, the top-mast went over the side. It was blowing at the time a heavy gale of wind; and it was impossible, from the heavy sea that was running, to cast loose the booms, or send the spare top-mast aloft, for some twenty-four hours subsequently to the accident occurring.

butt-slings promptly sent aloft as a substitute for the parted parrel.

The Table on the next page may be found useful on occasions where doubts arise as to the weight and stowage of cordage which the boats of a ship may conveniently carry.

WEIGHTS OF CORDAGE.

Inches.	CABLES.	Cwt.	qrs.	lbs.
24	1 fathom to weigh	1	1	4
22	... ...	1	0	9
20	... ...	0	3	16
19	... ...	0	3	6
17	... ...	0	2	16
16	... ...	0	2	8
15	... ...	0	1	27
14	100 fathoms	41	2	20
13½	... ...	38	3	1
13	... ...	35	3	9
12½	... ...	32	3	17
11½	... ...	30	1	10
11	... ...	25	5	10
10½	... ...	23	1	17
10	... ...	21	0	3
	HAWSER LAID.			
6½	130 fathoms to weigh	13	1	11
6	... ...	11	1	13
5½	... .	9	2	2
5	... ...	7	3	19
4½	... ...	6	1	22
4	... ...	5	0	14
3½	... ...	3	3	7

Inches.	HAWSER LAID.	Cwt.	qrs.	lbs.
3	130 fathoms to weigh	2	3	20
2½	... ...	2	0	5
2	... ...	1	1	6
1½	... ...	0	3	13
1	... ...	0	1	20
¾	... ...	0	1	4
	CABLETS.			
9½	120 fathoms to weigh	22	2	9
9	... ...	20	1	17
8½	... ...	18	0	26
8	... ...	16	0	6
7½	... ...	13	3	16
7	... ...	12	0	18
6½	... ...	10	1	19
6	... ...	9	0	12
5½	... ...	7	3	7
5	... ...	6	2	1
4½	... ...	5	0	23
4	... ...	4	0	18
3½	... ...	3	1	22
3	... ...	2	2	11
2½	... ...	1	3	0
2	... ...	1	1	4

Table shewing the Weight of 100 *fathoms of Cable-laid Rope, from* 2 *to* 26 *inches.*

Size.	Threads.	Weight.			Chain.	Size.	Threads.	Weight.			Chain.	Size.	Threads.	Weight.			Chain.
		Cwt.	*qrs.*	*lbs.*				*Cwt.*	*qrs.*	*lbs.*				*Cwt.*	*qrs.*	*lbs.*	
2	27		3	26		10½	576	21	0	19	1	19	1881	69	0	17	1⅞
2½	36	1	1	8		11	630	23	0	18		19½	1980	72	3	4	
3	54	1	3	25		11½	684	25	0	15	1⅛	20	2088	76	3	1	
3½	72	2	2	16		12	747	27	1	23	1⅛	20½	2187	80	1	16	
4	99	3	1	6		12½	810	29	3	3		21	2295	84	1	14	2
4½	108	3	3	24		13	882	32	1	19		21½	2403	88	1	10	
5	135	4	3	23		13½	954	35	0	7	1¼	22	2520	92	2	16	
5½	162	5	3	22		14	1026	37	2	24		22½	2646	97	1	8	
6	189	6	3	21		14½	1098	40	1	12	1⅜	23	2763	101	2	8	2⅛
6½	216	7	3	21		15	1170	43	0	1		23½	2880	105	3	14	
7	252	9	1	1		15½	1251	45	3	26	1½	24	3006	110	2	1	2⅛
7½	288	10	2	9		16	1332	48	3	24		24½	3132	115	0	16	
8	336	12	0	26	¾	16½	1413	51	3	21		25	3258	119	3	2	2⅛
8½	378	13	3	15		17	1503	55	1	0	1⅝	25½	3393	124	2	16	
9	423	15	2	25		17½	1593	58	2	6		26	3528	129	2	22	2⅛
9½	468	17	0	22	⅞	18	1683	61	3	13	1¾						
10	522	19	0	21	1	18½	1782	65	2	1							

RULES AND INSTRUCTIONS FOR SAIL-MAKING.

THE following directions, touching the cutting, goring, sewing, seaming and roping of sails have been cautiously culled from the best authorities:—

CUTTING OUT SAILS.

SAILS are cut out cloth by cloth, the width being governed by the length of the yard, gaff, boom, or stay; the depth by the height of the mast. The width and depth being given, find the number of cloths the width requires, allowing for seams, tabling on the leeches, and slack cloth; and in depth, allow for tabling on the head and foot. Sails cut square on the head and foot, with gores only on the leeches, as some top-sails are, the cloths on the head between the leeches are cut square to the depth; and the gores on the leeches are found by dividing the depth of the sail by the number of cloths gored, which gives the length of each gore. The gore is set down from a square with the opposite selvage, and the canvas being cut diagonally, the longest gored side of one cloth makes the shortest side of the next; consequently, the first gore being known, the rest are cut by it.

For the length of gores corresponding to the depth on the selvage, observe the following table.

Table shewing the length of any gore by its depth, from one inch to six feet in depth, on the selvage of canvas twenty-four inches wide.

Depth down the Selvage.	Length of the Gore.	Depth down the Selvage.	Length of the Gore.	Depth down the Selvage.	Length of the Gore.
Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.
0 1	2 0	2 1	2 10¾	4 1	4 7
0 2	2 0	2 2	2 11½	4 2	4 7⅞
0 3	2 0⅛	2 3	3 0¼	4 3	4 8¾
0 4	2 0¼	2 4	3 1	4 4	4 9⅝
0 5	2 0⅜	2 5	3 1¾	4 5	4 10½
0 6	2 0½	2 6	3 2½	4 6	4 11⅜
0 7	2 0¾	2 7	3 3¼	4 7	5 0¼
0 8	2 1⅛	2 8	3 4⅛	4 8	5 1⅛
0 9	2 1½	2 9	3 5	4 9	5 2
0 10	2 1⅞	2 10	3 5⅞	4 10	5 2⅞
0 11	2 2¼	2 11	3 6¾	4 11	5 3¾
1 0	2 2¾	3 0	3 7⅝	5 0	5 4⅝
1 1	2 3¼	3 1	3 8½	5 1	5 5½
1 2	2 3¾	3 2	3 9⅜	5 2	5 6⅜
1 3	2 4¼	3 3	3 10¼	5 3	5 7¼
1 4	2 4¾	3 4	3 11⅛	5 4	5 8⅛
1 5	2 5¼	3 5	4 0	5 5	5 9
1 6	2 5¾	3 6	4 0⅞	5 6	5 10
1 7	2 6¼	3 7	4 1¾	5 7	5 11
1 8	2 7	3 8	4 2⅝	5 8	6 0
1 9	2 7¾	3 9	4 3½	5 9	6 1
1 10	2 8½	3 10	4 4⅜	5 10	6 2
1 11	2 9¼	3 11	4 5¼	5 11	6 3
2 0	2 10	4 0	4 6⅛	6 0	6 4

In the Leeches of Topsails cut hollow,* the upper gores are longer than the lower ones; and in sails cut with a roach leech, the lower gores are longer than the upper ones. This must be regulated by judgment, and care taken that the whole of the gores do not exceed the depth of the leech. By drawing on paper the gored side of the sail, and delineating the breadth of every cloth by a convenient scale of equal parts of an inch to a foot, the length of every gore may be found with precision.

Sails gored with a sweep on the head or foot, or on both, have the depth of their gores marked on the selvage, from the square of the given depth on each cloth, and are cut as above; the longest selvage of one serving to measure the shortest selvage of the next, beginning with the first gored cloth next the middle in some sails, and the first cloth next the mast leech in others.

For those gores that are irregular no strict rule can be given; they can only be determined by the judgment of the sail-maker, or by a drawing, and a scale of equal parts.

Although, in the following directions, the total amount of all sweep-gores is calculated at the rate of so many inches per cloth, each cloth has only such a gore as will form the sweep required.

The length of the reef and middle-band is governed by the width of the sail at their respective places. The

* Straight leeches, it is said, will be introduced into His Majesty's service by the present Surveyor of the Navy.

leech-linings, buntline-cloths, TOP-LININGS, MAST-CLOTHS, and CORNER PIECES, are cut agreeably to the depth of the sail, and are particularly directed hereafter. Each cloth and every article should be properly marked with charcoal, to prevent confusion or mistake.

SEAMS.

SAILS have a double flat seam, and should be sewed with the best English-made twine of three threads, spun three hundred and sixty fathoms to the pound, and have from one hundred and eight to one hundred and sixteen stitches in every yard in length.

The twine for large sails used in the navy is waxed by hand, with genuine bee's wax, mixed with one-sixth part of clear turpentine; and, for small sails, in a mixture made with bee's wax, four pounds; of hog's lard, five pounds; and clear turpentine, one pound. In some instances, the twine is dipped in tar, softened with a proper proportion of oil.

It is the erroneous practice of some sail-makers not to sew the seams any farther than where the edge is creased down for the tabling; but all sails should be sewed quite home to the end, and, when finished, should be well rubbed down with a rubber.

Boom-main-sails, and the sails of sloops and drivers of ships generally, have the seams broader at the foot than at the head.

The seams of courses and top-sails are stuck or stitched up, in the middle of the seams, along the whole length, with double seaming twine; and have from sixty-eight to seventy-two stitches in a yard.

TABLINGS.

THE tablings of sails are of a proportionable breadth to the size of the sail, and sewed at the edge with sixty-eight to seventy-two stitches in a yard.

LININGS.

MANY sails have linings in various parts, to give them additional strength; such as the reef-bands, middle-bands, leech-linings, buntline-cloths, &c.

All linings are seamed on, and stuck with from sixty-eight to seventy-two stitches per yard.

Reef-bands should not be put on till the sail is sewed up; and it is the opinion of many, that middle bands should not be put on till the sail is half worn.

HOLES.

HOLES are made by an instrument called a pegging awl, or a stabber, and are fenced round by stitching the edge to a small grommet, made with a log or other line. When finished, they should be well stretched or rounded up by a pricker or a marline spike.

Sails have two holes in each cloth at the heads and reefs of courses, top-sails, and other square sails; one hole in every yard in the luff of flying-jibs; and one in every three-quarters of a yard in the luffs of other stay-sails.

REEF AND HEAD HOLES of large sails have grommets of twelve-thread line, worked round with eighteen or twenty-one stitches; small sails have grommets of nine-thread line, with sixteen or eighteen stitches, or as many as shall cover the line, and smaller holes in proportion.

In order to strengthen sails, it has been recommended to have the holes in the heads and reefs placed thus:—One hole to be made in the seam, another in the middle of the canvas, and so alternately; the holes in the seam to be half an inch lower than the hole in the middle of the canvas. By this the strain would lie upon the holes in the seam, which are more capable of bearing it than the holes in the middle of the single canvas.

It is likewise recommended to cut these holes with a hollow punch, instead of making them with a stabber or pricker.

The holes for marling the clues of sails and the top-brims of top-sails have grommets of log line, and should have from nine to eleven stitches. Twelve holes are worked in each cloth.

Marling-holes of courses are of three-fourths of the depth of the tablings at the clues from the rope, and those of top-sails are at half the depth of the tablings at the clues, and top-brim from the rope.

BOLT-ROPE.

Bolt-rope should be well made of fine yarn, spun from the best Riga-rhine hemp, well topt, and sewed on with English-made twine of three-threads, spun two hundred fathom to the pound. The twine in the navy is dipped in a composition made of bee's wax, four pounds; hog's lard, five pounds; and clear turpentine, one pound; and, in some instances, the twine is dipped in tar, softened with oil.

Bolt-ropes should be stowed in a stove by the heat

of a flue, and not in a baker's oven, or a stove tub; and tarred in the best Stockholm tar. The flexibility of them should be always considered, in taking in the slack, which must rest on the judgment of the sail-maker.

The clues and top-brims should be wormed while the bolt-rope is sewing to the sail, and before both parts are confined.

Bolt-ropes of all sails should be neatly sewed on through every cunline of the rope; and, to avoid stretching, the rope must be kept tightly twisted while sewing on, and care taken that neither too much nor too little slack is taken in. They are to be cross-stitched at the leeches every twelve inches in length; at every seam, and in the middle of every cloth at the foot, with three cross-stitches. Four cross-stitches should be taken at all beginnings and fastenings off; the first stitch given twice, and the last three times. Small sails have two cross-stitches at every seam, and three at every fastening off.

CLUES.

THE clues of large sails are made of rope, called a CLUE-ROPE, which splices into the bolt-rope; but the clues of smaller sails are formed with the bolt-rope only.

The clues of fore courses are made with clue-rope, being larger than the bolt-rope in the same proportion as the clue-rope of main courses. It splices into the foot-rope at the first buntline cringle, and into the leech-rope at one-eighth of the depth from the foot. It is prepared and fastened in other respects like the clue-rope of main courses.

The clues of main and fore-top-sails are made of the foot-rope, which is left sufficiently long* to form the clues, and splices into the leech-rope at the lower bowline cringle. It is wormed, parcelled, and served at the clues, and three feet each way from them; it is marled on to the sail for the extent of the serving on each side the clues, which are seized as those of main and fore-courses.

The clues of top-gallant-sails and royals are made of bolt-rope, which is served home to the clues: the clues only are served with spun-yarn, and seized with small line.

CRINGLES.

CRINGLES should be made of the strands of new bolt-rope, half an inch smaller than the bolt-rope on the sail in which they are stuck.

Reef and reef-tackle-pendant cringles are stuck through holes made in the tablings, and the lower ends are put through the bolt-rope once more than the upper ends, being more liable to be drawn out.

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* When clues are fitted dog-and-bitch fashion, it becomes necessary to *shorten* them. This method of fitting clues is little known in the service. It is strongly recommended, and must be ever appreciated by practical seamen.

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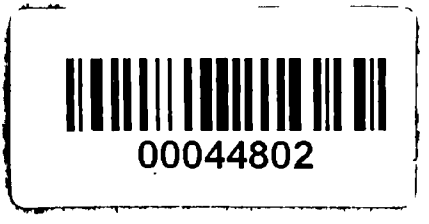
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